Astronomical Dating of Events & Select Vignettes from Indian History

Volume I

Edited and compiled by

Kosla Vepa

Published by

Indic Studies Foundation,

948 Happy Valley Rd.,

Pleasanton, Ca 94566, USA

Email:webmaster@indicstudies.us

http://www.indicstudies.us

ISBN 978-1-4357-1120-4

Astronomical Dating of Events & Select Vignettes from Indian History

Volume I

Edited and compiled by

Kosla Vepa

A Source Book for Researchers

Based on Proceedings of the Session on Chronology and Distinguishing Characteristics of the Indic Civilization

Human Empowerment Conference

Dallas, Texas

October 12-14, 2007

Table of Contents

Foreword: Need for historical revision

N.S. Rajaram PhD

Background

I am most grateful to Dr. Kosla Vepa for giving me this opportunity to share some thoughts on the importance of historical revision. And rightly, he has chosen chronology as a vital area that needs close attention.

George Santayana once wrote: "History is always written wrong. It needs always to be rewritten." But curiously, the Indian history establishment following Independence has stubbornly taken the position that the version of history that it inherited from the colonial masters, with some slight modifications in the name of 'secular correctness,' is final with regard both the chronology and the identity of the participants and the interpretation of events in history. This is what one sees in dogmatic religious cults but hardly what one expects in searching for truth. Since new evidence from archaeology, astronomy, natural history as well as literature throws up major contradictions between theories and data, it is essential re-examine old theories in fresh light.

Returning to the problem of chronology, there are two basic roadblocks in ancient Indian history: the Aryan myth and the Chandragupta-Sandracottus identity or the so-called Greek synchronism. The Aryan myth has now been exploded, and the theory has metamorphosed into the task of separating Harappan archaeology from the Vedic literature. This too is on its way out and only the political influence of its protagonists is keeping it alive. This is unlikely to last much longer.

The Greek synchronism, which equates Sandracottos of Greek sources with Chandragupta, the founder of the Mauryan Empire has not received the same critical attention as the Aryan myth. The problem is both qualitative and chronological. As K.D. Sethna showed in his book *Ancient India in a New Light,* accepting Greek synchronism leads to serious contradictions with Indian records. Qualitatively, a critical examination of the Greek and other Western sources suggests that Alexander's campaign in India was far from successful and he probably met defeat at the hands of Poros and was forced to retreat. This has a major bearing on most of the early Indian dynasties from the Mauryas to the Guptas, including the date of the Buddha.

For the present, I would like to focus on the contradictions bedeviling the Vedic and Harappan periods. The contradictions between the various historical theories (and their conclusions) about ancient India and the data they claim to interpret are so wide-ranging and persistent that I can at present do little more than highlight some of their more obvious aspects. One of the points of the present essay is that the entire enterprise of historical writing is fundamentally flawed, and nothing less than a complete overhaul is called for. Further, this overhaul has to be supported by empirical evidence and carried out with due respect to the primary sources from the natural sciences, archaeology and the literature. Mere tinkering with details will not take us out of the present morass.

Going back untold millennia India and East and Southeast Asia have been bound by ties of geography, climate and ecology. This is reflected in the natural as well as the human imprint on the region. The former include ecology, climate and flora and fauna; the latter is reflected in the region's history, culture, and religious beliefs. The inhabitants of this vast region have never doubted it: Chinese, Malays, Thais, Indonesians and every other people, with the possible exception of the people of the Philippines who came under the rule of the Catholic Spain for several centuries, have left records that attest to this closeness.

These millennia-long ties were interrupted during the three centuries of European colonialism, which led to the imposition of a Eurocentric twist on the history and culture of the region and its people. In the case of India this resulted in a reorientation of her history and culture, with the new colonial rulers seeking sources and origins in the West and the Northwest, closer to their own. As part of this colonial reorientation, beginning at the end of the eighteenth century, and continuing to the present, historical theories have sought a Eurasian and even European source for the origin and growth of ancient civilization in India, especially Vedic India.

The main result of this on Indian historiography has been a turning away from the natural and the human links that bind the region's past towards a contrived historical and anthropological milieu made up of theories rooted in Eurasia and Europe. Inevitably, these have given rise to numerous contradictions between theory-based conclusions and hard evidence. These contradictions between theories and data suggest that the methodology used by scholars for the better part of two centuries must have been seriously flawed. Before we examine the methodologies, it is useful to take a brief look at some of the contradictions that plague the current version of history and historiography.

Contradictions: theory and evidence

The contradictions between the various historical theories (and their conclusions) and the data they claim to interpret are so wide-ranging and persistent that we can at present do little more than highlight some of their more obvious aspects. Here is a brief catalog of contradictions:

1. History books speak of an 'Aryan invasion' from Eurasia or even Europe, but there is no archaeological record of any invasion and/or massive migration from Eurasia in the Vedic period. If anything we find traces of movements in the opposite direction— to West Asia and even Europe.

2. The geography described in the *Rigveda,* including the river systems, corresponds to North India in the fourth millennium BC and earlier and not Europe or Eurasia. Astronomically, there is nothing in the *Rigveda* that suggests knowledge of the heavens as they would have appeared later than c. 4000 BC.

3. Flora and fauna described in the Vedic literature, especially those found in the sacred symbols, are tropical and subtropical varieties and not from the temperate climate or the steppes.

4. The climate described in the ancient literature and the religious practices followed (like the *caturmasya*) correspond to what is found in North India.

This mismatch between theory and evidence is not limited to the natural environment and their interpretation. In quantitative terms also, there is huge time gap—exceeding a thousand years—between the dates assigned to significant features and what we actually find. These include:

1. Indian writing is supposed to be based on borrowings from the Phoenicians or derived from Aramaic, but the Indus (Harappan) writing is more than a thousand years older than the oldest Phoenician examples known.

2. Naturalistic art with realistic depictions is supposed to have evolved in India under Greek influence, but we find superb realistic depictions in Harappan remains in the third millennium BC. To paraphrase John Marshall: "The Indus artist anticipated the Greek artist by more than 2000 years."

3. Indian astronomy is claimed to be borrowed from the Greeks, but the *Vedanga Jyotisha* cannot be dated later than the 14^{th} century BC. The name itself, Vedanga, indicates it is later than the Vedas, so the astronomical references in the Vedas must be older. In addition, Harappan archaeology of the third millennium BC belongs astronomically to the 'Krittika period' (vernal equinox in Krittika or the Pleiades cluster in Taurus), which is mentioned in the later Vedic literature. This places the Harappan civilization later than the *Rigveda* and not before it as claimed by historians.

4. Migrations: The major migration or invasion—the famous or infamous Aryan invasion—is supposed to have taken place after 2000 BC, but available genetic evidence shows that the people of India have lived where they are for tens of thousands of years, perhaps as long as 50,000 years or more.

The last point is worth a comment. While colonial historians (and their successors) have been trying to link the Indian people (and the flora and fauna) to the Eurasian steppes, biological studies show that their links to monsoon Asia are much closer and also older. This is hardly surprising considering that India and Southeast Asia constitute a single ecological and climatic zone— dominated by the Himalayan glaciers and the summer monsoon.

It is clear that we need a serious re-examination of history— both of the chronology and of the descriptive accounts. Three fundamental tasks suggest themselves: (1) establishing independent chronological markers that connect literary accounts and datable physical features; (2) determining the identity of the people of India on scientific grounds, independent of historical and/or linguistic theories; and (3) accounting for the impact of environmental and ecological changes in the past 10,000 years and more and the human imprint that it has left.

A valuable beginning has been made in the present volume by addressing some of these issues, focusing on chronology. I suggest that several issues raised in this essay—chronology, archaeology, astronomy, especially natural history—be taken up in future seminars and volumes. I suggest also that a critical study be made to interpret the Harappan iconography against the background of Vedic thought. My work with David Frawley and the late Natwar Jha has indicated that this can be a fruitful area of research.

Once again I thank Dr. Vepa for giving me this opportunity to share my thoughts and look forward to future seminars and volumes on these topics.

Preface

Kosla Vepa PhD

It is my contention that the unraveling of the history of a civilization, a nation or geography is primarily a forensic science while the unfolding of history as it happens is a behavioral science. If we accept such a premise, history, therefore, has all the accoutrements of a science, contrary to the belief of most. The decipherment of the history of a nation needs expertise in many fields. Apart from the traditional fields of Archaeology, Linguistics, Anthropology, Epigraphy, and Numismatics, some of the modern and non traditional approaches which are more akin to forensic science which is the science of solving crimes and deciphering the causes of failure of engineering systems, include the following;

Mining and dating of Civilizational knowledge

By this we mean, the investigation and dating of the knowledge of the ancients in various fields such as Literature, Mathematics and astronomy, medicine, linguistics, logic, the evolution of civil and criminal law, the science of statecraft, the science of weaponry etc. In addition, it is by now regarded as conventional knowledge, that the ancient books of India such as the Vedas contain knowledge that is encrypted. This was largely necessitated during the era that a codified standardized script had yet to be developed and resulted in most of the text being written as Sutras (aphorisms). The technology involved in writing sutras is highly sophisticated but its success is gauged by the fact that such a large number of manuscripts have survived for the era of the ancients with even less tampering of the text than in the later era, when the Brahmi and Devanagari scripts were developed. In many instances the transmittal of knowledge using sutras was a signal accomplishment of the very highest order. It is unfortunate that the codified hidden meaning behind many of the verses may be lost to us forever, since the practitioners of the art, who are primarily Brahmana pundits are much reviled in the very land where they have made such outstanding contributions, and the ranks of such Pandits are thinning by the day as they migrate into non-traditional professions such as Business Management, engineering, academic

Manuscript preservation, dating and research - This is self explanatory. However for India this has special significance in that, India has by far the largest collection of ancient & medieval manuscripts in the world.

Archaeo astronomy is the study of the inscriptions in the sky as they were observed by the ancients and replicating them by back calculation using commonly available planetarium software. This is a highly rational approach to dating where the assumptions are clearly laid out and yet a large proportion of Occidental Indologists , of whom Whitney, Thibaut and Oldenburg are typical, either conveniently ignore this evidence or belittle its significance . The extent of the bias against what should be a fairly rational argument, is documented by Edwin Bryant[1].Bryant makes mention of the disparaging remarks made by Whitney that nothing in the Rig Veda nor in the Brahmanas, "and nothing in the later Sanskrit literature tends in any degree to give us the impression that the ancient Hindus were observers, recorders, and interpreters of Astronomical phenomena". This is surely an astounding statement when placed in juxtaposition with the opinion of W. Brennand[2] whom we have quoted elsewhere in this volume.

[1] **Edwin Bryant,** The quest for the Origin of the Vedic culture, pp 251-266, Oxford university Press, 2001,, ISBN 0195137779

[2] See quote at the end of Chapter 3

We can only assume as in other such instances that Napoleon's dictum is apropos, namely 'attribute not to malice that which can be attributed to incompetence'

Significant clues can be obtained by studying the patterns and travels of the Catholic clergy especially the Jesuits, who undertook large scale intelligence gathering operations immediately after the formation of the Society of Jesuits for the purpose of purloining knowledge from other parts of the world

The people who reside in the subcontinent subscribe overwhelmingly to the traditions inherent in the Indic civilization. Equally relevant, significant parts of Asia also subscribed almost exclusively to the traditions of the Indic civilization. It is thus for this reason that India regards herself as a Civilizational power. Such a viewpoint is not new. Both Arnold Toynbee[3] and Samuel Huntington[4] have remarked on the capacity of the Indic Civilization to influence the people in the rest of the world. It is a common thread running through the early writings of Jawaharlal Nehru continuing on to the viewpoint of Jaswant Singh[5]. What does it mean to be a Civilizational power? Simply, it means that for a large part of its history spanning several millennia and except for an interregnum of 8 centuries of foreign domination, India has exerted considerable influence on the cultures and civilizations of most of Asia. To those who infer such an influence to be mostly a historical curiosity with no relevance to the present, I would draw attention to the equally widespread acceptance of Indian movies (this industry is commonly referred to in the subcontinent as Bollywood) throughout the world. It is interesting that the play Kalidasa's Sakuntala, which had already captivated Goethe, was performed at the campus of the University of California at Berkeley more than a hundred years ago. In addition, a new phenomenon which has arisen in the world is the ubiquitous presence of highly skilled and even more highly educated Indian technologists, engineers, doctors, software engineers and the increasing dependency of the West, in particular the US, on Indian technological manpower. Truly, few would have anticipated, even as late as 2 decades ago, the extent to which the Indian Diaspora has spread to the four corners of the globe. For the most part, the Diaspora has been a 'giver' rather than a 'taker' when it comes to matters such as civilization, culture, the arts, the sciences and in Engineering.

It is also becoming clear that within the next 2 decades the Global Indic population will contain within it one of the largest subset of English speaking peoples in the world, anchored by about 250 million English speakers in the Indian subcontinent. This has major implications for India and the rest of the world. It is not a historical oddity that India was the progenitor of the science of linguistics beginning with such stalwarts as Panini, Patanjali, Yaska and Bhartrihari. With its rich linguistic diversity, rooted for the most part in its ancient languages such as Sanskrit and Tamil, it is not unlikely that India will once again become the center of excellence of such spheres of study. Furthermore, the Indic is a voracious reader and the sheer volume of publications from India, will in short order, and overwhelm the world wide English language book publishing industry.

But the evolution of such a large English speaking population has implications that go beyond the obvious commercial consequences. The English language spoken in India will evolve with its own idiom and 'shabda pramana', to quote Bhartrihari and will be a significant contributor to the world wide dominance of the English language. Such a development is viewed with certain amount of misgiving both in India and in the Occident, but it appears to be an irreversible process, and in the marketplace of ideas, the English language reigns supreme. While

---

[3] **Arnold Toynbee** A Study of History

[4] **Samuel Huntington** The Clash of Civilizations

[5] **Jaswant Singh**, National Security, Lancer Publications

a discerning individual such as Macaulay would rest content with what he has wrought, he would also note that this could be a Pyrrhic victory, and that such a development has had unintended consequences, which might result in the shifting of the intellectual center of gravity of the English language away from the Anglo American geography where it currently resides.

Even from the much truncated narrative that passes for the History of India as it is taught today in India and the rest of the world, one cannot but conclude that India occupies a unique position in this planet both in a geographical sense as well as in a Civilizational sense. It has been our observation that the uniqueness of the Indian civilization and history is also accompanied by a unique set of threats to her security. It is our contention, that these threats to her development as a viable and respected nation state, anchored in a unique Civilizational ethos, are very real and that indeed her very survival as a nation state and a civilization is in question if not in jeopardy, if she chooses not to address these threats in a coherent manner.

While developing the thesis as set forth above, it is the purpose of this volume to review the history and civilization of India with particular relevance to those issues which impinge on the global image of India as a civilization. At the end of the book the reader can assess how well he have met our objectives

At the core of the opposition to India, amongst many quarters in the world, is the notion that Indian nationhood is a nebulous entity. Winston Churchill is reported to have remarked with his characteristic contempt for anything Indian, that India is merely a geographical expression and that “it is no more a country than the Equator” .We have demonstrated in our presentation titled the South Asia File that the effort to undermine the cultural cohesiveness of the subcontinent and to portray it as not merely a diverse but as an inchoate and incoherent set of peoples was a major undertaking of the colonial overlord. In the process he obfuscated the dates of significant events, mangled the sequence in which these events occurred and despite much evidence to the contrary and with a few notable exceptions[6], consistently belittled the scientific and technological heritage of the subcontinent.

We have made a prima facie case in the presentations contained in this volume for the proposition that the current history of India as conjured up the colonial power is substantially in error. In subsequent volumes we will elaborate on various themes, while deciphering the true history of India.

In order to get out of this morass of faulty assumptions, we need a major paradigm shift from the manner in which the Occidental views the Ancient Indian past. By linking their own past with the Sanskrit Language (which is eminently reasonable) but at the same time refusing to accept any scenario in which the residents of the subcontinent are credited with the genesis and development of their own civilization (which in our opinion is a non-sequitor), the Occidental has put himself in an impossible situation, from which he cannot exit without loss of face. The reason for this is that he continues to view the human species as a collection of races, where intellectual and Civilizational accomplishments are directly a function of the physical appearance of a person. It is imperative for his own development that the Occidental discard this medieval pre-renaissance paradigm.

I would like to acknowledge a whole host of people, who have influenced, either directly or indirectly the activities leading up to this volume, but I will restrict myself to a very small subset of this universe. I am grateful to Dr. N S

[6] I am referring to the works of W. Brennand, John Playfair , Jean Sylvain Bailly, , Thomas Henry Colebrooke, and Herman Jacobi

Rajaram, who despite his busy schedule has kindly agreed to write a foreword to this volume, where he makes an ardent plea for the rewriting of Indian history from the ground up.

I am also deeply indebted to Dr. S Kalyanaraman for drawing my attention to the Sarasvati issue and grateful for his encouragement and friendship ever since the time that we corresponded on the Indian civilizations yahoo group several years ago. I cannot be eloquent enough in expressing my appreciation of the guidance that Sri Rajiv Verma has extended to me. He has been unstinting in sharing his experiences and providing valuable comments.

I am deeply appreciative of the encouragement given to me by the team at India-Forum.com, including, Viren Honnaya, L Arvind, Muthukumar Prakashan, Dinesh Acharya, Rajesh Goswami Mudita Purang and others. Many moons ago, my attention was drawn to a website called Bharat Rakshak by Durvasula Ramana Murty and I owe my renewed interest in writing about such matters to him and the forum and its administrators & participants, notably, Arun Sharma, Shivshankar Sastry, Jaideep Menon and Ratnendra Pandey.

I would like to acknowledge my brother Ranjan and my son Sanjay for letting me sound of on this topic on numerous occasions. Finally, I need to mention the 2 women in my life, my wife Suguna and my daughter Kalpana for having the patience to put up with the long hours that this effort has taken, when I was in the 'ozone' layer.



(1922 words)

Chapter I Why are History and the Chronology Important

Kosla Vepa PhD

It is taken as largely axiomatic in the study of the History of the Indic peoples[7], that the civilization that remains extant has been brought into the area by migrating races such as the Aryans, and in fact some would argue, that such a statement holds also for the so called Dravidians of India. According to such a narrative everything that was worth preserving has been handed down to us over the centuries by migrations, within the last 3 1/2 millennia, into the subcontinent, from somewhere else. It is also true that the history that is taught the children of India today is vastly at variance with the puranic accounts handed down to us over several millennia. It is to state it without any embellishments, a revised history that is completely at odds with the traditional history of India. Even so great an effort as *the History and Culture of the Indian people* edited by RC Majumdar, the most famous of Indian historians at the time of Independence accepts the basic framework, the steel frame, of the History of India as revised by the British colonialists. Fifty years after independence the narrative has not changed and the banner of the colonial version of history is now borne by the Indian left including the Communists and the large part of the Indian political establishment that espouses the Indian version of a political dogma encompassed in the general rubric of Secularism[8].

It is not our contention that History should never be revised, but it should certainly never be done peremptorily at the behest of an invader, simply because the colonial power deems it to be so. Every change that the colonial power has wrought and most of these as can be seen from the table below was introduced by the erstwhile colonial power should be examined for motive and authenticity.

Table 1 the inconsistencies in the current narrative of Indian history

The inherent contradictions of the Aryan Invasion Theory by the mythic and yet to be identified Aryan race.
The insistence on clinging to a racial terminology even when it is widely discredited and abandoned elsewhere
The insistence that Indic astronomy , geometry and mathematics was not autochthonous to India but was

[7] We will define the adjective Indic (as in Indic civilization) to be inclusive of all the people who derived their civilization from the Dhaarmic traditions of the Indian subcontinent. For the most part we will restrict ourselves to the subset of those residing in the subcontinent including most of present day Afghanistan and some eastern regions of present day Iran

[8] See for instance my essay on Secularism and the Hindu, http://www.india-forum.com/essay/130/1/Secularism-and-the-Hindu

borrowed from the Greek or the Babylonians, without any evidence
The origin of the Brahmi script becomes a victim of the 'anywhere but India' syndrome
Devaluation and denigration of the extent of the ancient Indic contribution to Mathematics and Astronomy
Dating of the Mahabharata
Dating of the Satapatha Brahmana
Dating of the Veda
Dating of the Vedanga Jyotish
Dating of the Sulva sutras
Beginning of the Vikrama era
Dating of the Buddha
Dating of the Arthasastra
Dating of Chandragupta Maurya
Dating of Panini's Ashtadhyayi and consequentially the dating of Panini himself
Dating of Aryabhata
There are resulting inconsistencies in the chronology of the Indic historical narrative, which is now horribly mangled to fit the straightjacket of British assumptions.

A substantial percentage of Indians now feel they have a stake in the preservation of this false history and when confronted with the reality of their acquiescence to a false and revised history of their own land by a very recent arrival on the scene, react with irrelevant responses such as "why blame the British" (the issue is not one of blame, and the issue is not about Britain or the British,, for after all we are in great admiration of the British for the extraordinary sagacity they displayed in prolonging their imperial rule by every artifice imaginable). We have also dealt with the systematic approach that the British used to remake the weltanschuung of the Indic and to create an international image of the Indic that is much at variance with reality, and the success they achieved in the resulting internalization of these views by the Indic himself in our essay titled ***The South Asia File***.

My objective in this seminar is not to recite a litany of grievances against the Occidental (rhymes with oriental) but to give a philosophical underpinning to the long and steady evolution of the Indic civilization it breadth and what is indeed remarkable its staying power. The other great civilizations have either altered significantly or been driven extinct. There is very little left of the Greek civilization (although the west fancies itself the successor to the Greco Roman civilization. The ancient Greeks would be considered Pagans by the established churches today, and hardly any of their life style remains. It is also important to remember that most of the Greek savants were natives of Asia Minor and their life style was more akin to that of Persia than that of France or England, neither of which were pretty far along the Civilizational curve, in any event, during that period of history.

Importance of Chronology

The Indic civilization is for all intents and purposes the only one, amongst the ancients, surviving virtually intact. The Gayatri mantra and the invoking of Savitur are at least 7000 years old. It already asks for enlightenment and not for bread, because they had mastered agriculture and had no problem with adequate food. People (west of the Urals) wonder what happened to the Indus Valley civilization. Nothing dramatic happened they just moved on and their descendants became the Gujaratis, Maharashtrians and other residents of modern India. It is this unbroken continuity that rankles with the Occidental, because he is all too conscious that his own history is replete with wars (e.g. the hundred year's war between England and France), extinct civilizations, and destruction. Hence, his obsession to endow India with a similar heritage.

A false chronology leads to false conclusions about who we are as a people in very fundamental ways. For example the Aryan Invasion Theory (AIT) seeks to bestow on us a heritage which is far removed from the Vedic heritage in very significant ways and constrains our History with a timeline that is totally artificial, ignores our whole puranic history and devalues the unique nature of the culture and ethos of the subcontinent. Even after 150 years when it was first proposed, the postulation of the AIT, remains that a postulate and a hypothesis without any empirical evidence to bolster it. As Dr Rajaram remarks in his customary pithy manner in the foreward

"For the present, I would like to focus on the contradictions bedeviling the Vedic and Harappan periods. The contradictions between the various historical theories (and their conclusions) out ancient India and the data they claim to interpret are so wide-ranging and persistent that I can at present do little more than highlight some of their more obvious aspects. One of the points of the present essay is that the entire enterprise of historical writing is fundamentally flawed, and nothing less than a complete overhaul is called for. Further, this overhaul has to be supported by empirical evidence and carried out with due respect to the primary sources from the natural sciences, archaeology and the literature. Mere tinkering with details will not take us out of the present morass."

We who are of Indic heritage realize only too well that a mere claim of antiquity will not gain us the respect of the world. We are fully cognizant that antiquity is not even necessary to achieve dignity and respect, but it is indeed remarkable to see the great lengths that some amongst the occidentals today will go, to deny us the antiquity which we feel is the right one. If indeed the occidental regards antiquity as merely incidental to his heritage or to his weltanschauung, his actions bespeak otherwise. The ferocity with which he argues against our historical heritage is only matched by the tenacity with which he would deny us a place at the table with other major powers, and that is another story unto itself.

Methodology

One of the goals of this seminar is to arrive at a robust methodology and associated axioms that Indic narrative of our past should adhere to. In every case we should examine the implied and explicit assumptions we make and the validity of the resulting inferences. We regard ALL APPROACHES as fair game (including numismatics, deciphering the inscriptions in the sky using astronomical software that can be employed for back calculating events of the past , epigraphy where available etc. The caveat is that it must adhere to and not violate a consistent episteme or pramana. It is my firm conviction that the current history, as revised by the colonial overlord, and taught to our children worldwide does not meet the minimum standards of any episteme. I do not know of any civilization or nation that lets its history be hijacked by those who have a minimum accountability to ensure its veracity and in fact has an agenda that is very cavalier and nonchalant, if not hostile to our traditional heritage. Till the advent of independence we had an excuse that we were held on a short leash by the colonial overlord, but what is the excuse today ?

We hold as canonical, the axiom that an accurate history and chronology is an essential adjunct of any civilization as it evolves into different paradigms in the future. Put simply, if we do not know our past (or have merely a vague notion of and a nonchalant interest in our past), we would be severely handicapped in evaluating the decisions we make for the future. I was always under the impression that to repeat or emphasize this tautology would be akin to preaching to the choir. I was astonished to learn that there are significant numbers who do not subscribe to this notion.

We will focus on methodologies and principles to follow, conscious as we are that in the space of 7 hours, it would amount to hubris, to attempt to rewrite the history of this multifaceted but unique heritage of the subcontinent.

Transmittal of Knowledge – Was there theft of Intellectual Property

There is another point to be made about the direction in which knowledge was transmitted. Many have been the individuals from other parts of the world who studied at Indian universities like Nalanda, Takshashila, Vikramshila, and Odantipura till the 12th century. It was a rare instance where they would go back and denigrate the knowledge they had so acquired or the land they acquired it from, and in fact went out of their way to eulogize the education they received at these locations which were studded all along the Gangetic valley, but particularly so in Vihara (Bihar). However all this changed during the 16th century when the Society of Jesus (Jesuits) sent highly educated (for those days) individuals, the number sometimes exceeding 70 or 80 at any given point in time, whose sole purpose was to extract as much information from the people who practiced such skills, like Jyotisa[9] Pandits and engage in intellectual property theft. What defines such activity as theft? If the recipient does not acknowledge the source of his teaching then it is fair to call it theft. The reason for the initial refusal to reveal to the source of their knowledge may have been due to the terror exerted by the Catholic Church during the Inquisition and after, that any knowledge attributed to pagan sources would be punishable by death. In a landmark publication and a sweeping and scholarly coverage of the History of Mathematics, CK Raju[10], the Indian Polymath has recounted the sequence of events leading up to the sudden spate of discoveries by Mercator, Clavius, Tyco Brahe, Fermat and Pascal. But whatever the reasons for the medieval savants of Europe to not reveal their sources, there is certainly little reason to maintain the charade that the Occident did not derive anything of value from India

A question that often occurs to most of us, and I am certain we are not unique in this respect, is to ask why the Indic civilization which had reached such lofty levels several millennia ago, has sunk to such depressed levels today. I am sure the answers to this question are manifold, but we have attempted to peel the layers of the onion to understand why we are where we are today. If we come across as placing the responsibility for such a transformation on others such as the British and the Islamic invaders, who marauded the land for over 7 centuries, that certainly is not the intent. The responsibility for being at the current state of affairs clearly lies with all of the people of the subcontinent, but we feel it is an obligation even a duty to seek the causes of this transformation and let the chips fall where they may. Civilization is a precious good, in the words of Will Durant, and its fragile structure and delicate fabric can easily be disturbed leading to extinction of cultures as we have seen repeatedly throughout History. The Indic civilization may have survived one onslaught but may not be sufficiently resilient to future such onslaughts, should they occur. It behooves us therefore to seek to understand the nature of the threat(s) that the civilization faces as she enters a new millennium.

[9] A word is in order regarding the meaning of the word Jyotisa. Jyotisa is commonly translated as Astrology in the west (David Pingree calls it an Astral text – what does that mean?), but if one picks up the Vedanga Jyotisa and thumbs through its contents, there is very little astrology in it. It is almost entirely an astronomical treatise. The Vedanga Jyotisa places Timekeeping at the head of all Sastras, describing it to be like the plume of the peacock or the crest jewel of serpents. Time, as we have always suspected, is a very pregnant concept. The two very interesting books on time are by Stephen Hawking and C K Raju (The Eleven Pictures of time

[10] Raju, C K., The Cultural Foundations of mathematics, PHISPC, Center for the Study of Civilizations

We end with the following resolve

"*Let it resound in the distant regions of this planet, whether there are those that wish us well or ill, that we shall pay any price, bear any burden, meet any hardship, support any friend, oppose any foe to assure the survival of the cherished values and traditions of the Indic Civilization* "

(2211 words)

Chapter 2 Warnings of History

T Hanuman Chowdary Ph.D

While the modern, largely European concept of nation-states is just about 200 years old (22 principalities of Germany were united by Bismarck in 1871 under Prussia's leadership to become the German nation state; still leaving out German Austria as a separate state; England is UK only since 1801; Italy is one nation state only for less than 150 years with various city states and provinces united as the modern republic of Italy by the efforts of Garibaldi and Mazzini; USA is a nation state only since 1776), the people of India had always considered themselves as one people, Bharatiyas; in one country Bharat Varsha. The Sanatana Dharma and its culture unite the people. We have been one people, one nation with one land but many kingdoms all owing allegiance to *dharma*. The same gods, the same temples, the same tirthas, and same mythologies were revered by all the people, all over the land but in their different languages, ways of life, and food and clothing etc.

First, it was the communists of India who said (in the 1940s) that India is not one nation but a conglomeration of nationalities; they said that Muslims (by dint of their religion); people speaking different languages like Telugu, Tamil, Gujarati , Marathi are all different nationalities, each one entitled to its own sovereign state. This evil formulation to disintegrate the millennial Bharatiya Rashtra came out of the evil application of Joseph Stalin's theory of nationalities and their right to self-determination. Under Lenin and Stalin, the dictatorship of the communist party created proforma independent republics for the different nationalities like Uzbeks, Tajiks, Georgians, Ukrainians, Armenians, etc. They were in fact vassal states of imperial Russia.

The communists in India were outdone by the evil genius, Mohammed Ali Jinnah and his Muslim League. First, Jinnah and the Muslim League said that Muslims in India are a minority and wanted safeguards to preserve their religion in a democratic India where Hindus would be the overwhelming majority. Gradually, Jinnah and the Muslim League abandoned the concept of minority and safeguards for it in favour of the concept of Muslims as separate nation. This notion was already promoted and broadcast by the communists. In the event, India was partitioned, Congress party and Mahatma Gandhi who swore that India would not be allowed to be divided humiliatingly succumbed to terrorism of the Muslim League unleashed on their Direct Action Day 16th August 1946 and the massive violence unleashed on Hindus from then onwards. The Muslim inhabitants of India who voted and rioted for the partition of India and created the Islamic state of Pakistan from where all Hindus and Sikhs etc had been completely cleansed, are now once again asserting their separate entity and as in the past, the vote-hungry Congress presided by a foreign-born person is taking several steps to confirm the separate Muslim identity and eventually, nationhood.

The Sachar Committee report accepted by the Congress led UPA government will be accelerating the demand of the residue of Muslims in our country for separate nationhood and separate states. 126 districts in the country are earmarked for Muslimfication by the Ministry of Minority Welfare presided over by Abdul Rehman Antulay. In this context, it would be most educative if we read some of the passages from Kulapati K M Munshiji's short work.

Warnings of History (Trends in Modern India) published by Bharatiya Vidya Bhavan in 1963.

"What are the forces which lead to the rise or fall of nations? How do nations rise and fall? That implies another enquiry : What are the factors which go to make a virile nation? When do they run amuck?

"These factors, though often derived from geographical compactness or the unity of language, are not necessarily dependent on them. Men living in the same geographical area do not necessarily make a nation. Men speaking the

same language or following the same religion do not always make a nation. Switzerland and Canada are multilingual nations. UK and USA, India and Pakistan, though speaking the same language are different nations.

“Three such factors are invariably found in virile nations: common memory of achievements, will to unity, and habitual urge to collective action.

“First, the people constituting a nation have a common memory of great heroes and exploits of great adventures and triumphs in the past. Japan, perhaps, represents the finest example of ancient memories, tenaciously preserved. The same could be said of Hindus, but I wonder whether the same would be said about them two decades hence.

“Historic forces often have not given a common memory to communities living in a single country; they often look upon their past from different angles, and, in consequence, cannot form a nation. Hindus looked up to Rana Pratap and Shivaji as their heroes; the Muslims admired Mahamud Ghazni and Aurangazeb; in this antagonistic outlook lay the seed of Pakistan. The common memory, though limited, which we now share in India is that of mutual influence in the past, and of freedom struggled for and won in the present.

The British and the French in Canada, and the French, the Germans and the Italians in Switzerland, have short but living memories of common adventures and triumphs sufficiently vital to make them a nation.

“The USA has solved the problem in a characteristic way. Every year foreign emigrants pour into the country, fleeing from oppression or seeking wealth. However, due to its educational system, in the third generation if not in the second, their descendants acquire, as if they were their own, the memories of Washington and Abraham Lincoln and of the colossal achievements for which USA stands.

“In India, eleven years have been wasted by a sterile educational policy. *(Our education continues to be not only sterile but poisonous as regards India’s true history).* Many things could have been done in this interval to give to young men and women a common memory of our struggle. But it was not done. A generation [*two generations by now*?] has now grown up which takes freedom for granted but draws no inspiration from the way it was won.

“The second factor which plays a great part in the birth and growth of a nation is the will to national unity in a people. Nationalism implies a sustained effort on the part of the people to *will* themselves into a nation.

“But who are the people? In all collective affairs of men, we should remember, it is what Toynbee calls the dominant minority which speaks, creates and leads that counts. The masses are passive, following its lead or submitting to its influence or coercive power. When I speak of the will to unity, therefore, it is primarily the will of the dominant minority that I mean.

Table 2 The Will to National Unity

“The will to national unity is hard to develop but easy to be dissipated. Generally it is dissipated under certain conditions:
“First if the dominant minority has no sense of mission as regards the future of the nation;
“Second if its will to unity is fragmented by contradictory loyalties;
“Third if it becomes psychologically alien to the masses.

"All nations which have risen to greatness have been characterized by a sense of mission.

"In Japan we found a deep sense of mission. Its people cannot think of themselves as a lost people; they have faith in their culture and destiny; they have no regrets and no frustration.

"The dominant minority in USA has also a sense of mission to spread its free way of life throughout the world, to combat totalitarianism and to be in the forefront of material achievements. It is this Pillar of Fire which leads them on and leaves them no rest.

"This sense of mission we found very highly developed in Germany. In course of three decades the land twice came under the heels of foreign armies and its people were desiccated as never before in history. And yet their sense of destiny never dimmed; they reconstructed their life long before their conquerors could repair the ravages inflicted by victory.

"The strength of Communism is not in the validity of dialectical materialism, not in its armies and collectives, not even in Sputniks. It lies in its intellectuals who, intensively indoctrinated for two generations, have but one mission in life; to fulfill what they consider to be the predestined role of Soviet Russia in communizing the world and dominating it. The fundamental problem of the world therefore is whether what is called the 'Free World' can produce a matching sense of mission...........

"This sense is perhaps at its white heat in little Israel. Men and women come there from different parts of the world. Often they do not know any common language. Israel itself is suspended precariously over the mouth of a volcano---Arab hatred. And yet they are convinced that this little patch of a desert is their 'Promised Land'; that their race is pre-destined to an honoured place among the nations. Their passionate faith in the Jewish nation therefore is a burning flame welding them together. It drives them to perform the superhuman task of making ancient Hebrew a modern bond of unity and face the potential disasters with the indomitable calmness of a God-inspired mystic.

"During the last hundred years when we were struggling for freedom, the dominant minority of India had developed a sense of mission. We believed in our right to be true to our own culture; in our duty to suffer and, if need be, die for freedom; in our destiny to be free in order that, with the aid of our spiritual heritage, we could redeem mankind.

"If our sense of mission weakens,---as it has been of late-that is, if we cease to be true to ourselves and our culture; we lose confidence that we have a great role to play in history; if we come to look upon ourselves as a miserable, weak and poor people with no pride in our past and no faith in our future—our outlook will cease to be positive. Frustration, disappointment or despair will seize us. Disintegration will follow.

"However, the Indian mind through the ages had a deep sense of mission, and sooner than we realise, the younger generation will recapture it.

"Take the second condition. If a large section of the dominant minority prefers caste, region, linguism or religion as the object of paramount loyalty, the will to unity will be fragmented. In all countries, most people who constitute the dominant minority have a variety of loyalties; loyalty to one's family, to one's caste or class, to one's region or language, to one's religion and to one's nation. In a properly inter-related scheme of loyalties, the loyalty to the nation should dominate all other loyalties. That has been so in Germany and Japan, and that is the cause of their rise even after their catastrophic collapse in World War II..................

“The process going on in our country for the moment deserves serious attention. In the past, the Hindus had a superior loyalty to their religion, to Aryavarta---the Karma Bhoomi—in which they were born. But this group loyalty is being displaced by Indian nationalism and almost in the hour of victory, it, as well as the new nationalism, are being undermined by loyalty to the caste or the region. Prophets of disintegration are talking about nationalities in India, not the Indian nation. In search of regional selfishness we are also apt to forget our paramount loyalty to the country as a whole...........

“A pessimist would think that we are reverting to the pre-Akbar period, when region warred with region and all of them opened the gates to slavery. However, this is a passing phase; but it will pass only if the fundamental devotion of the average Indian to the Motherland is so strengthened that it will sweep away the caste or regional loyalties. We will have to go through distressing trials if this does not happen in the immediate future.

“The third condition arises from an impact of a conquering culture upon another. It raises no problems in USA and the countries of Europe, for there basically the outlook of the dominating minority and the masses is the same, for the leaders have drawn inspiration from the soil.

“In India and in several countries in Asia, however, the outlook of the dominant minority which has grown up under the influence of an alien culture tends to differ from that of the masses. As a result, the minority is no longer emotionally responsive to the urges which characterise them, as it speaks, thinks and acts under the influence of an alien outlook; the masses also do not f eel a sense of identity with it. Once this situation arises, the dominant minority, however active, is looked upon as alien and the will to unity becomes weak.

“In the pre-Gandhian period, to take our own case, the English-educated minority was Westernised in thought and outlook and the leaders often found it difficult to think in terms of the urges of the masses. Gandhiji could establish a complete identity between the minority and the people, because in this fundamental outlook he was one with them. He was to them not a Westernised political leader, but the sage, the saint and the saviour, of whom they had dreamt throughout the ages.

“It was expected that, after freedom, our dominant minority, following the Gandhian lead, would maintain this sense of identity with the Indian masses. Unfortunately, a new class has sprung up which again speaks in Western terms—I include Soviet countries in the West—and seeks to force Western experiments on our people. While this class complains that the masses do not respond to its call, it does not see that the fault is its own. It has not learnt to reflect the mind of the masses. It does not know the idiom of their life. It is too deeply engrossed in leading, directing and organizing from a higher pedestal. It does not realize that the aliens, though they may not be in blood and religion but only in feeling and thought, could only enforce a change, they could never inspire it.

“That is why the ruling class in many countries finds the Communist technique of coercing the masses to their way of living so handy.

“The last factor of great importance which goes to make a vigorous nation is the capacity of the people for collective action.

“The will to national unity is sustained only when the people are led, time and again, by the dominant minority to act with a common motive. The will when untranslated into action is only a morbid sentiment. Lurid examples of such sentiment having dominated us in the past can be easily found in our history.

“In the past, for instance, we dreamt of an Aryavarta and a Vikamaditya for centuries but it did not generate power to take collective action. When Prithviraj Chauhan fought Mahamed Ghori on the North-West Frontier, the rest of Hindu India looked on, and some of his Hindu neighbours nibbled at his home territory.

"I have never seen such a spontaneous urge for collective activity as in USA. Given a cause, however trivial, the people, even the children, organize themselves for collective effort. Even forward planning in industries is done by voluntarily organised groups or universities. Members of the Bar, generally the most individualistic of professions, are collectively working for constructive work. They neither look for initiative nor help to the government. Herein lies the greatest strength of American democracy.

"If any man knew the secret of inspiring collective action, it was Gandhiji. Not only he gave us a sense of mission but led us to spin in a mass, to learn Hindu and to invite Harijans into our temples, to break laws and go and herd ourselves in jails.

"In recent years, the dominant minority in India, with its sense of mission weakened, has failed to inspire us to collective action. At one time I thought that tree planting would become a spontaneous national movement as in Japan; our officers, too superior to care for mass reaction, saw to it that it just lapsed back into a forest department activity.

"Shramdan again, looked upon in UP, for some time at any rate, as a new religion had the seed of a dynamic collective action to reconstruct rural life. It inspired the will to work together for a time. But our development projects, in spite of their high potential for releasing collective action, are just official activities imposed from above; they have allowed Shramdan to peter off.

"You will see from what I have stated that common memories of achievements, will to unity and urge to collective action, play a great part in the rise of nations. If these factors do not exist, there is no nation. If they are weak, the nation is weak too. If they are fragmented, the nation tends to disintegrate. It is equally true that if they run amuck, nationalism explodes through sheer exuberance.

"When these factors become very powerfully inspired by an active sense of mission, they often lead to expansionism as in the case of Hitlerite Germany, or to exhausting wars as in the case of the wars which Napoleon and Aurangazeb waged. They may also lead to an inflated ambition to dominate the world or to enrich themselves at the cost of others as in the case of the Colonial Powers of the recent past.

"The process appears to be something like this: When nationalism runs riot, it acquires great strength and collects enormous wealth. Then material prosperity and hunger for power obsess its dominant minority to the exclusion of higher values. Once this phase sets in, national resurgence passes its zenith and begins to decline.

"Several dangers then face a prosperous and powerful nation. It may invite the wrath or jealousy of rival nations and go down before them in disastrous wars. It may also play up to its reputation and embark on suicidal conflicts, as in the case of the late Empire of Austria.

"Another danger, though insidious, is more potent. With great material prosperity and unlimited power, a nation loses its capacity for distinguishing between the true and the false, the right and the wrong, the beautiful and the ugly. The sense of mission disappears and men sink into sensual and material beings stripped of a sense of divinity. At this stage they lost their sense of imperishable spiritual values............"



(3,099 words)

S N Balagangadhara
"Colonialism is not merely about conquering territories, ruling over people and extracting revenues. It is a far more inhuman process, involving violence of all sorts: from the purely physical to the purely psychic. Colonialism alters the way we look at the world and it displaces native ways of experiencing the world through sheer violence. To the

colonized, there is no simple or naïve return to the lost world possible. Colonization forever changes the world of the colonized. Though tragic and reprehensible, this is what colonialism does and we need to understand this truth about ourselves in the first place.

If Islamic colonialism damaged the transmission of our culture, British colonialism, building further on this result, introduced a new framework for experiencing the world. More than that, it also introduced a new way of talking about our experience of the world. This framework told us many new things about ourselves: we were backward and primitive, steeped in superstition, and dominated by antiquated structures. The British taught us too what these structures were: the caste system was the Indian social structure and 'Hinduism', 'Buddhism', 'Jainism', 'Sikhism' etc. were our religious structures. For reasons I cannot go into here, Indians took to this way of talking about themselves the way ducks take to water. In the colonized field that the Indian mind had become, many Indians set up tents to sell their merchandise: an attack on the Indian caste system; an instant mixture of reform that could cure the ills of the Indian 'religions'; tracts and books that told tales of the tyranny of the Brahmin 'priests'; and, of course, the sale of the seductive siren songs of modernization and progress."

(3375 words)

Chapter 3 Some Fixed points in the Chronology of BhArata: Examining the astronomical records with Planetarium Software

B. N. Narahari Achar PhD

I. Introduction

Majumdar[11], the great historian, asserts that history records the achievements of man. According to him, history deals with facts, which can be known only from records kept. Western Scholars[12], while acknowledging that unlike other ancient civilizations, the ancient traditions in ***Bhārat*** have been preserved without a break down to the present day, have generally argued that ***Bhāratiyas*** lack a sense of history and that there is a dearth of 'historical texts' in ***Bhārata***, that contain records of dates and events. Hence, they deny the existence of any 'historical record' for ***Bhārata.*** These scholars have discounted the fact that two of the greatest epics of the world***, Rāmāyāṇa*** and ***Mahābhārata*** are traditionally regarded as ***itihāsa s***, i.e., historic texts and that there are in addition, a host of supporting texts in the form of ***Purāṇas***. Ignoring the fact that ***Bhārata*** has its own sense of history and the purpose of history[13], which differs from their own concept of history, the scholars have systematically misrepresented the chronology of ***Bhārata*** so as to fit some misguided theory[14] and have often proposed rather

[11] Majumdar, R. C., Raychaudhuri, H. C., Kalikinkar Datta, (1978) *An Advanced History of India*, Macmillan India Pvt. Ltd. , Madras

[12] Basham, A.l., (1953), *The Wonder that was India,* Grove Press Inc., New York

[13] ***dharmārtha kāma mokṣāṇāṁ upadeśa samanvitaṁ Ī***
pūrvavṛttaṁ kathāyuktaṁ itihāsaṁ pracakṣate ĪĪ

[14] the so called Aryan Invasion Theory or AIT, now thoroughly discredited.

fanciful hypotheses. For example, one scholar even suggested that ***Kṛṣṇa*** , the most important personality in the whole epic, was not in existence at the time of the ***Mahābhārata*** war! All of the ***itihāsa*** and ***Purāṇa-*** texts mentioned above have been considered less trustworthy as records of dates and events because of possible interpolations as they were transmitted orally over a very long period of time. However, these texts do contain references to astronomical events, many of which are genuine and can be regarded as inscriptions in the sky. If properly deciphered and validated, the astronomical events can form the basis of providing reliable chronology[15]. Recently powerful computer software products marketed generically as planetarium software[16] have become commercially available. These computer programs can project the view of the sky at any time, and at any place in the world, all at the touch of a mouse. The planetarium software can therefore be used advantageously to project the view s of the ancient sky and validate the "deciphering of celestial inscriptions," by comparing the descriptions in the texts with the actual views of the sky. The author[17] has shown that the astronomical references in various texts can be simulated using the planetarium software resulting in a reliable inference of the date of the events. The present essay examines a number of such texts and shows that a consistent and reliable chronology of ancient ***Bhārata*** can be established on the basis of simulations using the planetarium software. Our own sense of time is rooted in astronomy, for it arises from the three fundamental motions namely, the rotation of the earth, the revolution of the earth around the sun and the revolution of the moon around the earth. It is not at all surprising that a 'chronology' can be established on the basis of astronomy. It is a tribute to the wisdom of the ancient ***ṛṣis*** of ***Bhārata*** who have preserved for

---

[15] The pioneering works were done independently by Jacobi and Tilak. The method required knowledge of astronomy and demanded extensive calculations. These calculations had to be done manually in the early days. [6]

[16] Other Resources for Amateur Astronomers", *Sky and Telescope Magazine* (2001), vol 101 [7]

[17] Narahari Achar, (1999)"On Exploring the Vedic Sky with Modern Computer Software", Electronic Journal of Vedic Studies, 5-2.

posterity that chronology in terms of astronomical events as recorded in various texts.

The plan of the essay is as follows. First, the astronomical references in the epic ***Mahābhārata ,*** from which a date can be ascertained, are discussed. The methodology of arriving at a date is explained. The date arrived at is supported by star maps from the planetarium software. It is important to stress that the date of the war is determined solely on the basis of astronomical references in the epic ***Mahābhārata*** alone and the date is established independently of any other source, as the sheet-anchor for the chronology of ***Bhārata***. The consistency with other texts of Vedic and other traditions is then discussed. This is followed by a discussion of the consistency with the genealogy lists from ***Purāṇa*** texts. A further step in establishing the chronology of ***Bhārata*** is given in the simulations of the dates of certain inscriptions, namely, the dates of ***Vikrama saṁvat, Buddha nirvāṇa,*** and the date of ***Ādi Śaṅkara***. This essay goes a long way in demonstrating a consistent chronology of ***Bhārata*** through the simulations using planetarium software, with the date of the ***Mahābhārata*** War as the sheet-anchor and is largely in agreement with the chronology as advocated by Kota Venkatachelam and a host of other scholars.

II. The Date of the *Mahābhārata* War

The importance of the date of the ***Mahābhārata*** war as the sheet-anchor[18] for the chronology of ***Bhārata*** is too well known to be stated again. According to tradition, the war between the ***Kaurava***s and ***Pandava***s took place at the transition between ***Dwāpara*** and ***Kaliyuga***s[19], around 3000 BCE. However, ever since Western Scholars showed interest some hundred years ago in the epic and began to discuss its 'historicity', a lively debate (or rather a war of dates!) has been going on. While some scholars[20] declare that the whole epic is a myth denying any

---

[18] Kota Venkatachelam,(1954)*The Plot in Indian Chronology,* Arya vijnana, Vijayavada

[19] ***antare caiva saṁprāpte kali dvāparayorabhūt***
samantapañcake yuddhaṁ kurupāṇḍava senayoḥ ||MBh. I.2.9||

[20] Sircar, D. C., (1969), "The Myth of the Great Bharata War", in *The Bharata War and the Puranic Geneologies*,

historical truth to the story of the epic and ignore the tradition, many do believe[21][11] that the war actually took place, but are divided as to the magnitude of the event and as to the date when it actually took place. Some scholars portray the epic as an exaggerated account of a family feud. A plethora of dates ranging from before 5000 BCE to around 1000 BCE have been proposed[22] on the basis of estimates arrived at by using diverse methodologies (some based on fanciful assumptions) and there appears to be no consensus for the date.

Among the diverse methodologies used, one methodology that is of special interest here is the one based on astronomical references (of which there are more than one hundred and fifty in number, and occur scattered throughout the epic). More than 40% of all the articles and books[23] (totaling more than 120 in number) dedicated to determining the date of the War are based on the astronomical references. Although the astronomical references are scattered throughout the epic, most of the ones pertaining to the war occur in ***Udyogaparvan*** and ***Bhishmaparvan*** of the epic. Practically all scholars have characterized the references in ***Bhishmaparvan*** as astrological omens[24] and inconsistent and treat them as unsuitable for a 'scientific' analysis. The earlier works using the astronomical references were tedious and calculations were done manually and hence chose to use only a couple of the astronomical events out of the many available in the epic. More recent studies have used the computer software 'planetarium software' and consequently have considered a much larger number

---

University of Calcutta, pp 11-27.

[21] Gupta S. P. and Ramachandran, K. S.,(1976), (editors) *Mahabharata, Myth and Reality-Differing Views*, Agam Prakashan, Delhi; Sathe, S.,(1983) *Search for thr Year of the Bharata War*, Navabharati Publications, Hyderabad

[22] Vedavyas, E (1986), *Astronomical Dating of the Mahabharata War*, Agam Kala Prakashan, , Delhi. This is an exceptional book with an encyclopedic survey of literature on the topic. The date proposed in this work, 3138 BCE will be discussed later in the essay.

[23] Sathe (1983)

[24] Sengupta, P. C., (1947) *Ancient Indian Chronology*, University of Calcutta, Calcutta

sample of astronomical references in the epic. Still, until recently there appeared to be no convergence of the dates[25]. Some scholars have introduced ad hoc hypotheses in attempting to find some degree of coherence among the apparently 'inconsistent' astronomical references. It is clearly shown that the astronomical references are quite consistent and that such ad hoc hypotheses are totally unnecessary. The present article summarizes the results of a research conducted by the author over the past several years using planetarium software and the results have been published in several research publications. The research has shown conclusively that (i) the astronomical references in the ***Bhishmaparvan*** are not merely 'astrological effusions fit for mother goose's tales' (as once characterized by Professor Sengupta), but follow a ***Vedic*** tradition of omens and describe mostly comets and not planets as generally assumed, (ii)the few true planetary references in this parvan are identical to those in ***Udyogaparvan,***
Sharma (quoted by Iyengar in his paper in [25], p. 151) assumed that ***Vyāsa*** met ***Dhṛtarāṣṭra*** not just

once on the eve of the war, but several times and the planetary positions refer to different times. Iyengar (in [25], p.167) assumed that part of the text in ***Bhiṣmaparvan*** actually belongs to ***sabhāparvan*** and would rearrange the text of the epic to suit his model.

(iii) These common references lead to a unique date for the war, 3067 BCE.

(iv) all other astronomical references in the epic are consistent with the date

(v) The date agrees with the date given earlier by Professor Raghavan and is consistent with the traditional date~3000 BCE.

(vi) Using the planetarium software, it can be easily demonstrated that all other dates proposed by different authors are inconsistent with the planetary configurations referred to in (ii) above.

---

[25] Kamath, S. U., (Bangalore, 2004), (Editor) The Date of the Mahabharata War Based on Astronomical Data, Mythic Society. It has been common to make ad hoc assumptions to fit whatever model one is proposing and to bring some degree of consistency in the astronomical references in the Epic. For example, Sengupta [24] assumed that the pair of eclipses had occurred two years before the war and later inserted into the text.

III. A. Astronomical References in *Udyogaparvan*

Kṛṣṇa's mission for peace is so important that astronomical events in reference to that mission are recorded.

(i) ***Kṛṣṇa*** leaves for ***Hastināpura*** in the ***maitrī muhūrta*** in the month of ***Kārtika*** on the day of ***Revatī nakṣatra***.

(ii) On the way he halts at a place called ***Vṛkasthala*** and reaches ***Hastināpura*** on the day of ***Bharaṇī nakṣatra***

(iii) The meetings and discussions for peace go on till the day of ***Puṣya nakṣatra,*** when ***Duryodhana*** rejects all offers of peace. War becomes imminent.

(iv) ***Kṛṣṇa*** leaves ***Hastināpura*** on the day of ***Uttara Phālguni. Karṇa*** accompanies him in his chariot and has a long conversation with him.

(v) During the conversation ***Karṇa*** describes some omens he has seen that indicate a great harm to the ***Kuru*** family which include the following: ***śani*** is afflicting ***Rohiṇī, aṅgāraka*** has performed a retrograde motion before reaching ***Jyeṣṭhā*** and is prograde again having past ***Anūrādhā,*** the moon had lost all its luster on the full moon of ***Kārtika*** and a solar eclipse would appear to take place next new moon day.

(vi) At the end of the conversation, ***Kṛṣṇa*** sends a message to ***Bhiṣma*** and ***Droṇa*** through ***Karṇa*** that seven days from that day there is going to be an ***Amāvāsya at Jyeṣtha*** and that war rituals be started on that day. This must be the ***Amāvāsya*** that ***Karṇa*** refers to as the eclipse day.

Except for Professor Sengupta, these astronomical references are generally agreed to be genuine and pertinent by most scholars. Professor Sengupta does not have "faith in the astrological omens" described by ***Karṇa*** in (v) above. However, he does believe that the reference to ***'jyeṣṭha amāvāsya'*** is extremely important, but considers the reference to two eclipses occurring within thirteen days eclipses to be an interpolation.

III. B. Astronomical References in *Bhiṣmaparvan*

Sage ***Vyāsa*** meets with ***Dhṛtarāṣtra*** just prior to the war and describes the omens[26] he has seen. Among these omens described in 76 verses in two chapters are some 40 omens of astronomical nature described in four different segments. These are some of the ***most*** misunderstood astronomical references. On a superficial reading, and assuming that the astrological references to ***graha*** pertain to planets (as most scholars have done), the references are confusing and contradictory as each planet is seen in two different positions at the same time as given in the example below.

[26] ***iha yuddhe mahārāja bhaviṣyati mahāṅkṣayaḥ yathemāni nimittāni bhayāyadyopalakṣyate ĪĪ***MB (VI. 2. 16)||
"Oh King, a great destruction will occur in this war just as it is indicated by these omens, which are harbingers of great calamity."

Table 3

Purported planetary positions derived by Sharma by a superficial analysis

No.	Body	Location
1	Sun	a. In opposition to the moon, i.e., between δ-Scorpi and ι-Librae b. Rohini (Aldebaran or Antares)
2	Moon	a. Pleiades, a lunar eclipse described although not by its name b. Near the Sun, i.e., near one of the Rohinis, (Aldebaran or Antares)
3	Mercury (Dark Planet)	a. Antares b. Spica
4	Venus(white planet)	a) Between α-Pegasi and α-Andromedae, retrograde b) Spica
5	Mars	a. Regulus, retrograde b.Altair retrograde
6	Saturn	a. Aldebaran b. Near ι-Librae for one year together with Jupiter c. δ-Leonis
7	Jupiter	a.Altair b. Near ι-Librae for one year together with Saturn
8	Rahu or Ketu	a. Approaching the sun b. Between Spica and Arcturus c. Pleiades

Source: Sharma, *Archaeoastronomy Exercise*,
*Note:*According to Sharma these planetary positions are described by ***Vyāsa*** in his conversation with the king ***Dhṛtarāṣtra*** on the eve of the battle.

Since the astronomical references also occur in four different segments, scholars have

characterized them as probable interpolations and hence may be even unreliable. But, by a careful analysis the author has shown that ***Vyāsa*** is very systematic in his description and follows a very genuine ***Vedic*** tradition of omens. The astronomical omens occur in four segments because, they pertain to four different aspects of the impending disaster: (a) an imminent war, (b) great harm to the ***Kuru*** family, (c) destruction of both armies and (d) disaster to the entire population. Most of the omens pertain to comets and not planets. The only true planetary positions are described in segment (b) as the omens describing harm to the ***Kuru*** family, they are identical to those described by ***Karṇa*** earlier in ***udyogaparvan.*** That this is indeed a Vedic tradition is easily demonstrated, for example, by comparing the first segment of astronomical references in ***Bhiṣma parvan***: Chapter 2. verses 20-23 with some selected ***mantra***-s from ***AtharvaVeda Pariśiṣṭha.***

Table 4

References in (MB VI.2. 20-23) ***Vyāsa tells Dhṛtarāṣtra:***	***'yuddhalakṣaṇa'in Atharvaveda Pariśiṣṭha.***
"I observe the sun every day	"(In predicting war) one should always
both at sunrise and sunset and	consider
have seen him as if encircled by	the line of clouds and halos around the sun
long arms."	and the moon and observe whether they
"I see the sun surrounded by	appeared in color or not."(64.5.7)
halos on all sides, halos which	
are tri-colored, dark in the	"Which are blue and red towards the
middle and white and red	edges and dark in the middle and
towards the edge and	Accompanied by lightning."(61.1.4)
Accompanied by lightning."	

“I have been watching days and	“Whenever the sun is surrounded at
nights, the fierce sun, the moon	sunrise and sunset by tri-colored clouds, it
and the stars shining incessantly	indicates a great calamity to the earth and
and have been unable to	royal families.”(61.1.15)
distinguish between day and	
night. Surely this forebodes utter	“The color of the moon at the time of an
destruction.”	eclipse indicates a battle if it is red and
	disaster to cities and villages if it smoky
“On the full moon night of	or fiery.”(53.5.1-2)
kṛttika, the moon with a fiery	
tinge was hardly visible, devoid	
of glory and the horizons were	
also of the same hue.”	

It is clear that these are omens for an imminent war according to a Vedic tradition. In the second segment, ***Vyāsa*** describes some omens, which forecast a great destruction, especially to the ***Kuru*** family:

rohiṇiṁ piḍayanneṣa stitho rājan śanaiścaraḥŚ

vyāvṛttaṁ lakṣma somasya bhaviṣyati mahadbhayaṁ// MB(VI. 2. 32)

“Oh King, Saturn is harassing Aldebaran and the spot on the Moon has shifted

from its position. Something terrible will happen.”

abhikṣṇaṁ kampate bhūmirarkaṁ rāhustathāgrasatŚ

śveto grahastathā citrāṁ samatikramya tiṣṭatiŚŚ MB(VI. 3. 11)

"The Earth is experiencing tremors intermittently and Rahu (Moon's Node) has

seized the Sun. ***śvetagraha has transgressed Spica." These are identical to the omens described by Karṇa to Kṛṣṇa in udyogaparvan.***

Vyāsa describes in the third segment further indicators, in the form of comets, of the calamity to the entire army (senayoraśivaṁ ghoraṁ…). He names specifically a number of comets, śveta, dhūmaketu, mahāgraha, paruṣa, pāvaka, dhūma, lohitāṅga, tivra, pāvakaprabha, śyāma, ghora, and dhruvaketu, as can be seen from the original Sanskrit verses. All these names can be found in the list of comets given by Varāhamihira[27].

The word graha (from the root grahṛto grasp or to seize) refers to any heavenly object, which can move and hence can 'grasp' or 'seize' a star. Thus, it can refer to a planet or to a comet. It is true that nowadays in Indian astronomy, the word graha denotes only a planet. But, Vyāsa leaves no doubt to the fact that in Bhiṣmaparvan, the word graha refers to a comet:

"grahau tāmrāruṇaśikhau prajvalitāvubhau" MB (VI. 3. 24)

'the two ***grahās*** blazing with coppery red hair'. The heavenly object ***graha*** blazing with red hair in the context here can only refer to a comet. It may be noted that the word comet itself derives from the Greek word for hair. ***Vyāsa*** refers to son of Sun, ***sūryaputra***, explicitly, but he also refers to the comets by the name of the parent planets, i.e., Jupiter to indicate the comet son of Jupiter. While this is quite according to the Sanskrit grammar, it is this notation that has caused so much confusion and most scholars have interpreted them literally as referring to planets alone (instead of the comets which must have been meant). This has resulted in inferring conflicting planetary positions, when in actuality no planetary position is indicated.

---

[27] M. Ramakrishna Bhat, ***Varāhamihira's Bṛhatsaṁhitā,*** Part I. Edited with English translation. (Delhi : Motilal Banarsidass, 1981). According to ***Varahamihira***, the ancient Indian astronomers ***Parasara*** and ***Garga*** had observed hundreds of comets and regarded the comets as indicators of impending calamities.

In the final segment, ***Vyāsa*** describes the omens, which indicate the destruction of
the entire population: ***caturdaśiṁ pañcadaśiṁ bhūtapurvāṁ ca ṣoḍaśiṁŚ imāṁtu nābhijānāmi amāvāsyāṁ trayodaśiṁŚŚ MB(VI. 3. 28) candrasūryāvubhau grastāvekamāse trayodaśiṁŚ aparvaṇi grahāvetau prajāḥ saṁkṣapayiṣyataḥŚ***/ MB(VI. 3. 29)
"I know New Moon coinciding with fourteenth, fifteenth and also on the sixteenth day, but I have never known it coinciding with the thirteenth day. In one and the same month, both the Sun and the Moon are eclipsed on the thirteenth. These ill-timed eclipses indicate destruction of the people." This segment contains the famous reference to sequence of two eclipses within an
interval of thirteen days and in fact, almost identical to the omens described in ***Atharvaveda Pariśiṣṭha : yadi tu rāhurubhau śaśibhāskarau grasati pakṣamanantaramantataḥĪ puruṣaśoṇitakardamavāhini bhavati bhūr naca varṣati mādhavaḥĪĪ*** (AP 53.3.5)

The important planetary configurations

The important references to planets consist of those that are common to both ***Udyoga and Bhiṣmaparvan-s*** and include the following
(i) conjunction of ***śani*** with ***rohiṇi***
(ii) retrograde motion of ***aṅgāraka*** just before reaching ***jyeṣṭhā***

(iii) a lunar eclipse on the ***kārtika pūrṇima*** ,followed by

(iv) a solar eclipse at ***jyeṣṭha.***

These events lead to a unique year for the war. All other references in the epic are consistent with this date.

IV. Simulations using Planetarium Software and the date of the war

A search is made for the years in which there is a conjunction of Saturn ***(śani)*** with ***Aldebaran (Rohiṇi)*** between 3500 BCE and 500 CE. As Saturn takes an average of
29.5 years to go around the sun once, the event also repeats with the same period. There are 137 such conjunctions during the interval specified above. A search is then made for those

years from among these 137 dates when Mars ***(aṅgāraka)*** is retrograde before reaching Antares ***(Jyeṣṭhā).*** Since the retrograde motion of Mars repeats with the same period as its synodic period, a spread of two years on either side of each of the dates was considered in the search. The search reduced the set to just seventeen: 3271 BCE, 3067 BCE, 2830 BCE, 2625 BCE, 2388 BCE, 2183 BCE, 1946 BCE, 1741 BCE, 1503 BCE, 1299 BCE, 1061 BCE, 857 BCE, 620 BCE, 415 BCE, 28 CE, 233 CE and 470 CE, when Saturn was near Aldebaran and Mars executed a retrograde motion before reaching Antares. A search is then made for those years in which there is a lunar eclipse near Pleiades (i.e., on the ***KārtikaPūrṇima).*** This reduces the set to just two, 3067 BCE and 2183 BCE. It turns out that in both of these years the lunar eclipse is followed by a solar eclipse at ***jyeṣṭha.*** A sequence of 'two eclipses within a period of 13 days' also occurs in the two eclipse seasons. When one considers the fact that ***Bhīṣma*** passed away on the ***Māgha śukla aṣṭami,*** after the occurrence of winter solstice, a unique date results, for the winter solstice in January 13, 3066 BCE occurred on ***śuklapañcami,*** where as the winter solstice in 2182 BCE occurred on ***kṛṣnacaturthi.***

Thus a unique date of 3067 BCE for the date of the war emerges. The author has shown that this date is consistent with all the other astronomical references in the epic in several publications with the help of copious illustrations of star maps generated by Planetarium software. Some of them will be included as part of this essay by way of illustration

V. Illustrations

The star maps in figures 1-8 show that the astronomical events are reproduced. In figure 1, the ***day Kṛṣṇa*** starts on his diplomatic mission, it is clearly seen that moon is near ***revati,*** and ***^ani*** is ***at rohiṇi.*** Figure 2 shows the full moon in ***kārtika***, it also happens to be a lunar eclipse day. At this time, ***Kṛṣṇa*** is busy with the peace talks in ***Hastināpura.*** In figure 3, ***Kṛṣṇa*** rides with ***Kar%a*** after the failure of the peace mission, it is ***uttaraphālguṇi.*** Seven days from that day, it will be ***amāvāsya at jyeṣṭha. Kṛṣṇa*** sends the message to ***Bhiṣma*** and ***Droṇa*** to start the war rituals that day. Figure 4 shows the star map for that that day, which is also a solar eclipse day. The retrograde loop of Mars in that year is also shown in the figure. The retrograde motion of Mars before reaching ***Jyeṣṭha*** had occurred several months earlier. Figure 5 shows the day the war

starts: moon is at ***bharaṇi.*** Figure 6 shows the fourteenth day, when the war continues until the wee hours of the morning and stops when the moon rises. Figure 7 shows the last day of the war, it is ***śravaṇa nakṣatra and Balarāma*** returns. Figure 8 shows the day of ***Bhīṣma's*** expiry: ***śukla aṣṭami, rohiṇi nakṣatra.***

..

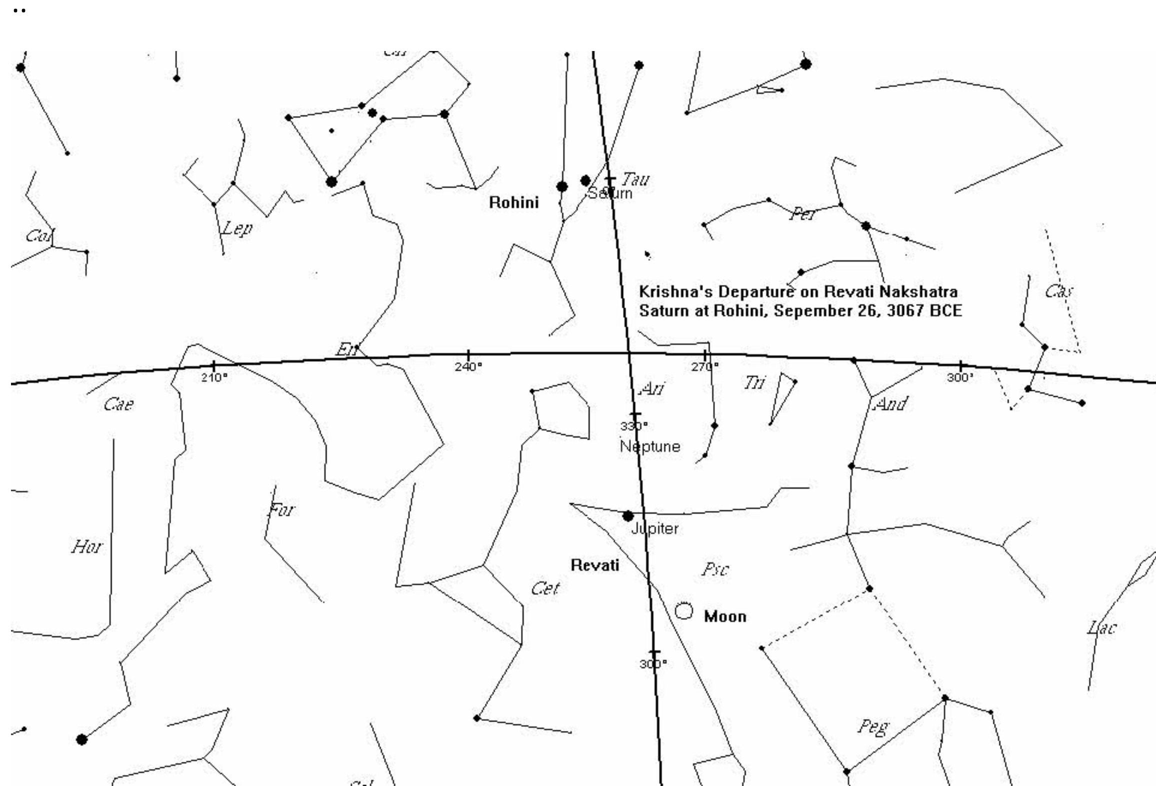


Figure 1. ***Kṛṣṇa's*** Mission for Peace: Departure on September 26, 3067 BCE. Figure 2. Full Moon of ***Kārtika.*** Lunar eclipse Day September 29, 3067 BCE

Figure 3. ***Karṇa rides with Kṛṣṇa uttara phālguni nakṣatra*** October 8, 3067 BCE

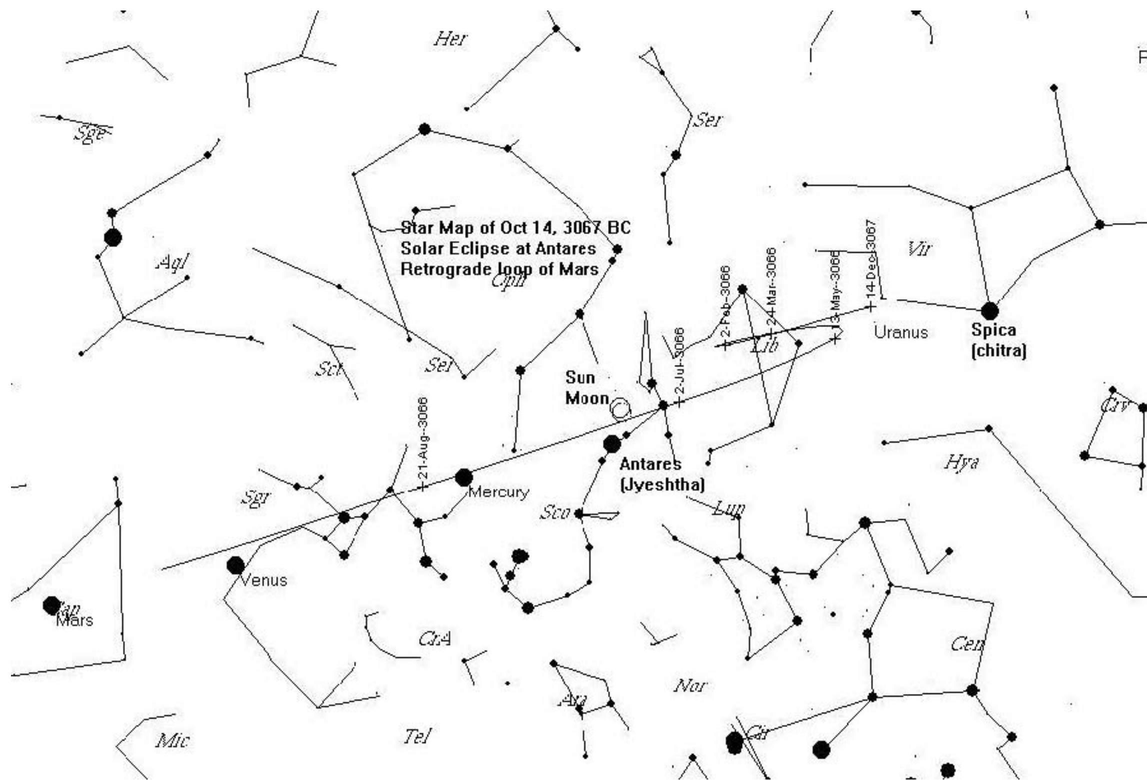


Figure 4. ***Jyeṣṭha amāvāsya*** solar eclipse day.October 14, 3067 BCE.; Retroloop of Mars

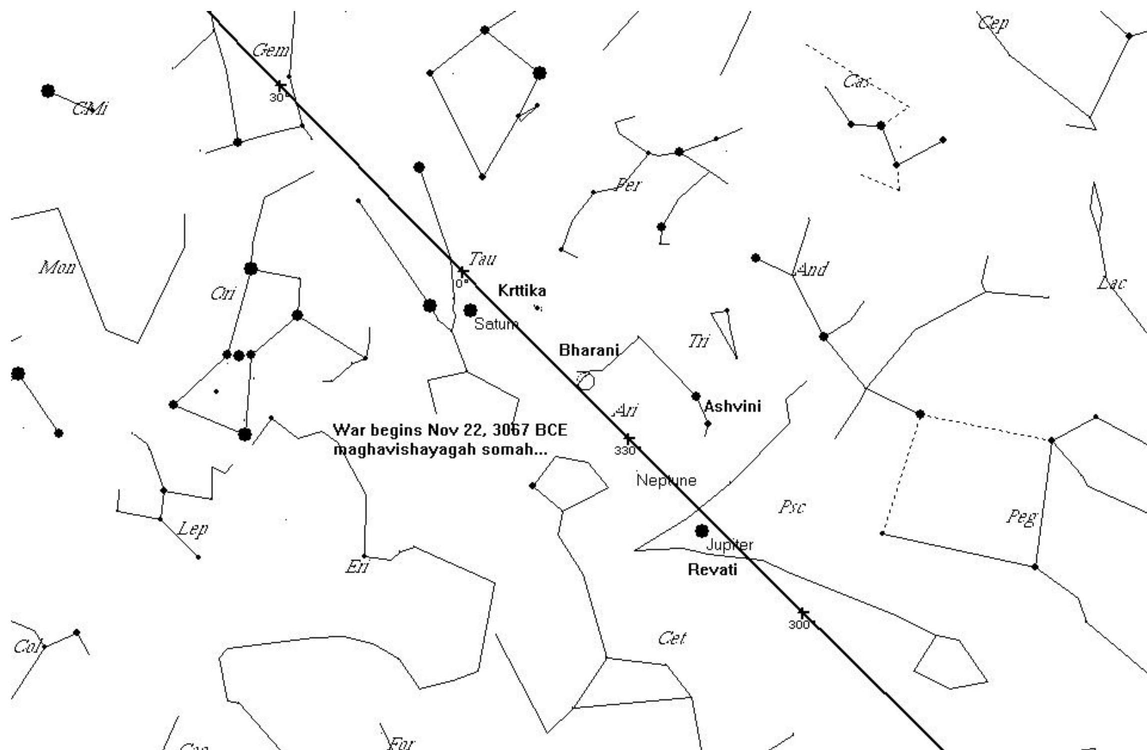
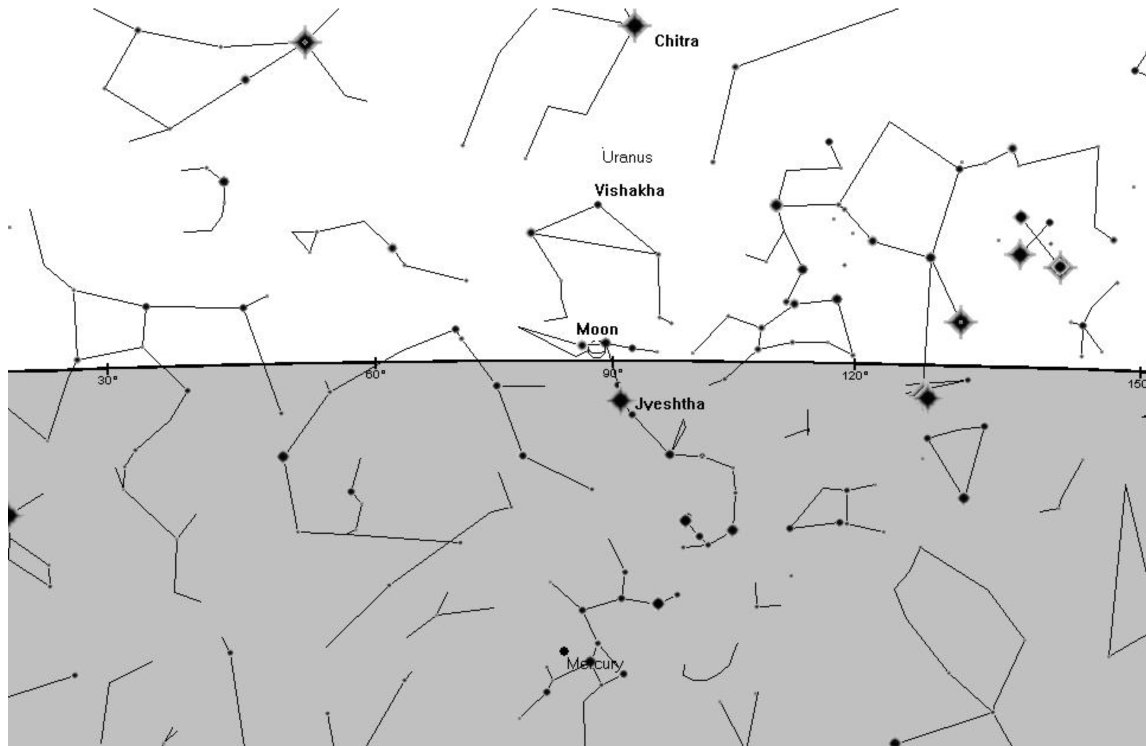


Figure 5. War begins November 22, 3067 BCE. It is ***BharaṇI*** day

Figure 6, Fourteenth Day of War. Moon rising at 2:30 am seen just above the horizon



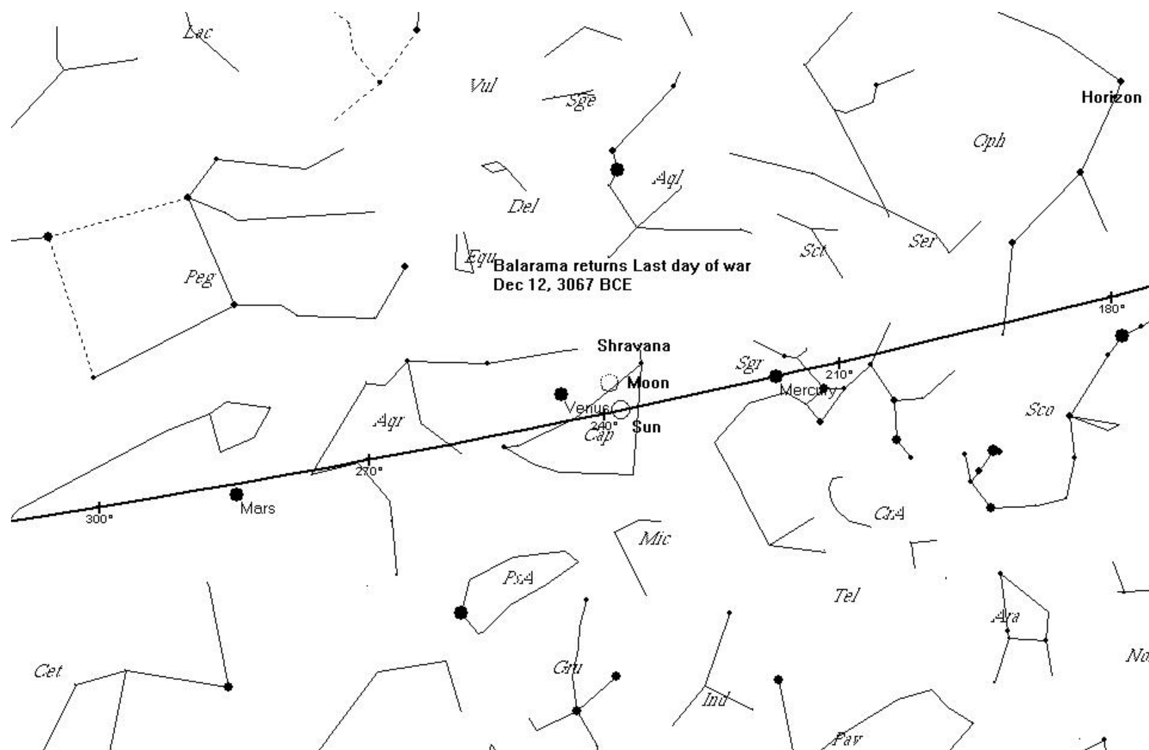


Figure 7. Last day of the war. Balarama returns on the ***śravaṇa*** Day.

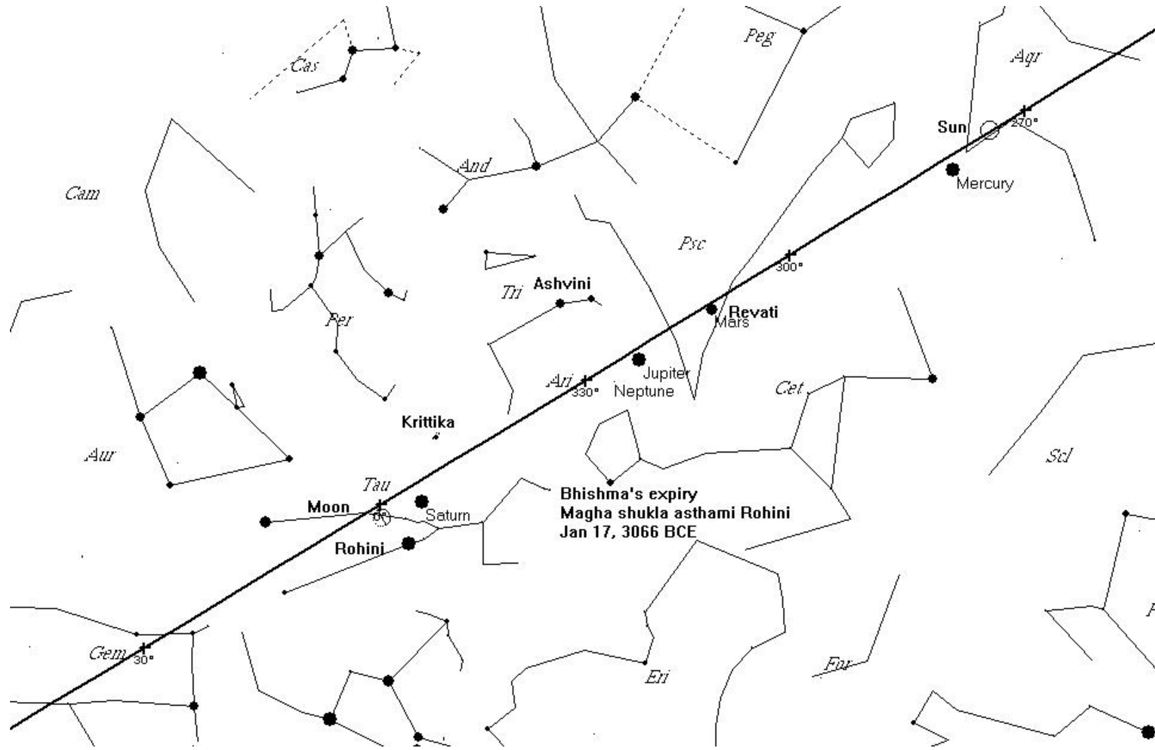


Figure 8. ***Bhiṣma's Expiry. Māgha śukla aṣṭami rohiṇi nakṣatra.*** January 16, 3066 BCE

The sheer volume of astronomical data and the consistency of the astronomical references reinforce conclusively the traditional belief that the war took place about five thousand years ago, and that the astronomical references are not clever interpolations of some latter day astronomer. The date established, 3067 BCE, provides the 'sheet-anchor' for the history of India

VI. The uniqueness of this date

It should be noted that the date of 3067 BCE has been derived entirely on the basis of astronomical information found in the epic alone. No information from any other outside source has been used. This date is identical to the date proposed by four other scholars. However, more than forty scholars have proposed a date for the ***Mahābhārata*** war ~3000 BCE.

Of these seventeen have proposed 3102 BCE, ten other authors have proposed 3101 BCE, seven authors have proposed 3139 BCE, some 3138 BCE, and 3137 BCE respectively. The question naturally arises which should be accepted and which should be rejected, if any. It is very easy to demonstrate that none of these dates can reproduce the astronomical events as described in the epic. For example, figure 9 shows the star map for October 19, 3138 BCE, it is ***jyeṣṭha amāvāsya,*** and according to Dr. Vedavyas, war began on that day. However, the day of ***jyeṣṭha amāvāsya*** is required to be a solar eclipse day, as per the conversation between ***Kṛṣṇa*** and ***Karṇa: rāhurarkamupeṣyati…and..saptamacchāpi divasād amāvāsyā bhaviṣyati….tamāhuḥ śakradevatāṁ,*** but October 19, 3138 BCE is not a solar eclipse day. The solar eclipse in that year had occurred on August 21 near ***hastā*** and not near ***jyeṣṭha.*** Furthermore, ***śani*** is at ***mūla*** and not ***rohiṇi,*** and ***aṅgāraka*** is at ***ārdrā*** (where he becomes retrograde later in the year) and not past ***anūrādha*** having become retrograde before reaching ***jyeṣṭhā*** as described in the epic. In short, none of the astronomical events described in the epic are satisfied for this date. The author has demonstrated this noncompliance for a large number of other dates that have been proposed for the date of the war. Additional details can be obtained from several publications of the author.

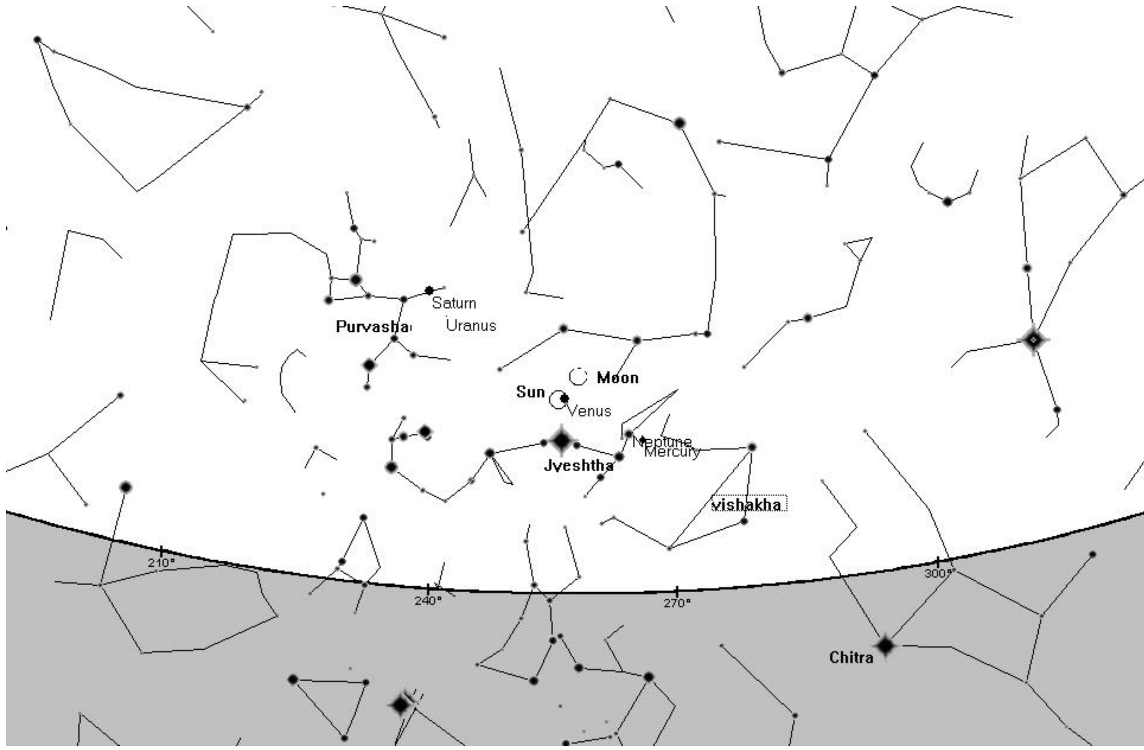


Figure 9. New Moon Day , October 19, 3138 BCE. ***Jyeṣṭha nakṣatra,*** but no eclipse; Saturn at ***m#la***

VII. Consistency of the Date of 3067 BCE with tradition

VII. A. Beginning of *kaliyuga* and Information from *Purāṇas*

According to Sengupta,[28] there are three traditions regarding the date of the ***Mahābhārata*** war, namely

(i) the so called ***Āryabhata*** tradition[29], according to which ***Pāṇḍavas*** lived at the beginning of the astronomical ***Kali*** age, 3102 BCE;

---

[28] Sengupta (1947

[29] ***kāho manavo ḍha manuyugāḥ śkha gatāstemanuyugāḥchnāca Ī***

kalpāderyugapādāgaca gurudivasācca bhāratātpūrvaṁ ĪĪ A.I.5 ĪĪ

(ii) 2449 BCE, based on the ***saptarṣi*** tradition as allegedly recorded by ***Varāhamihira***; [30]

(iii) the tradition of the ***Purāṇas***[2331], according to which from the birth of ***Parikṣit*** to the accession of ***Mahāpadmananda,*** there was a time interval is one thousand and five hundred years.

Based on the ***Purāṇa*** tradition, modern historians who have identified ***Chandragupta Maurya*** (who followed the ***Nanda*** s) to have lived in 324 BCE, assign a date ~1900 BCE for the war. All these three will be examined for consistency. It is to be reemphasized that the date of 3067 BCE has been derived independent of any of these traditions and is truly based on the internal evidence based on astronomical references found in the epic alone**.**

Āryabhaṭa Tradition

Āryabhaṭa declares[32] that when he was 23 years old, 3600 years of ***Kaliyuga*** had elapsed. This identifies the beginning of ***Kaliyuga*** with 3102 BCE. At first sight there appears to be some question about the consistency of the date 3067 BCE for the war with the beginning of ***Kaliyuga***, which is traditionally thought to have started after the war. A large number of scholars who have proposed the date of ~3000 BCE for the war rely on the information regarding the beginning of ***Kaliyuga*** in one-way or the other. However, the epic it self does not explicitly give any information about the beginning of ***Kaliyuga***. It is generally accepted that the astronomical beginning of ***Kaliyuga*** coincides with 17/18 February, 3102 BCE. The date of the war is then tied to the beginning of ***Kaliyuga*** (which according to some authors coincided with

---

[30] ***āsanmaghāsu munayaḥ śāsati pṛthviṁ yudhiṣṭire nṛpatau Ī***

ṣaḍvika pañcadviyutaḥ śakakālaḥ tasyarājñasyāt ĪĪ BrS

[31] ***yāvat parikṣito janma yāvat nandābhiṣecanaṁ Ī***

evaṁ varṣa sahasraṅtu jñeyaṁ pañcaśatottaraṁ

[32] ***ṣaṣṭyabdānāṁ ṣaṣṭiryadā vyatitāstrayaśca yugapādāḥ Ī***

tryadhikā viṁśatirabdāstadeha mama janmanotitāḥ ĪĪ A. III. 10ĪĪ

the end of the war and thus giving the date as 3102 BCE for the war). But there are others who take their clue from the ***Purāṇa-s,*** according to which ***Kaliyuga*** began with the departure of Lord ***Kṛṣṇa*** from this world, an event occurring after 36 years after the war. This results in the proposed date of 3138 BCE for the war. The spread of +/- 1 year on either side of these dates arises from slightly different modes of counting. Of course, the date 3067 BCE is posterior to 3102 BCE. Is there a conflict? Should not the war precede the beginning of ***Kaliyuga***? Not really. All that the epic says[33] is that the war occurred during the transitional interval between ***Dvāpara*** and ***Kali yuga***s, and nowhere it says exactly when the ***Dvāpara*** ended or ***Kali*** began. The ***antara*** or the interval between the ***yugas*** is quite extensive. According ***to Viṣṇu Purāṇa,*** the ***sandhyā*** for ***Dvāpara*** lasts for 200 years and for ***kali,*** it is 100 years. Thus there is a period of some 100 years or so, which can be legitimately referred to as ***sandhyā*** and 3067 BCE falls within this interval of 3102 BCE. In fact, there is some indication that the ***Kaliyuga*** had already started by the time of the war[34]. Even ***Bhāgavata Purāṇa*** acknowledges[35] that although ***Kaliyuga*** had already started, because of the presence of ***Kṛṣṇa, Kali's*** effect had been controlled. The full power of ***Kali*** became effective only with the departure of ***Kṛṣṇa,*** according to ***Kali rāja vṛttāṅta***[36] Thus there is no conflict with the war occurring in 3067 BCE and the reckoning of ***Kaliyuga*** from 3102 BCE.

---

[33] see foot note # 18 above

[34] ***etad kaliyugaṁ nāma acirādyatpravartate*** || MB. III.148.37||
The following remark is made when during the ***gadāyuddha***, ***Bhima*** hits ***Duryodhana***'s thigh, the ***adharma*** act being the result of ***Kali*** having already entered. ***prāptaṁ kaliyugaṁ viddhi pratijñāṁ pāṇḍavasyaca ĪĪ MB IX.59.21ĪĪ***

[35] ***yadā mukundo bhagavānimāṁ mahiṁ jahau svatanvā śravaṇiya satkathaḥĪ***

tadāharevā pratibuddhacetasāṁabhadrahetuḥ kaliranvavartata ĪĪ BP I.15.36ĪĪ

[36] ***yāvat sa bhagavān viṣṇuḥ pasparśemāṁ vasundharāṁ Ī***

tāvat pṛthviṁ parākrāntuṁ samartho nābhavat kaliḥ ĪĪ bhaga III, a. III ĪĪ

The alleged *Varahamihira* Tradition

Varāhamihira states in his ***Bṛhatsaṁhita*** that the ***saptarṣis*** were in ***maghā*** when ***Yudhiṣṭhira*** was ruling and to get the epoch of ***śaka kāla*** one should add 2526 years to the epoch of ***Yudhiṣṭhira.*** Historians have assumed that the ***śaka kāla or śaka nṛpati kāla*** refers to the ***Śālivāhana śaka*** of 78 CE. Thus arriving at the date -2448 (= 78-2526) or 2449 BCE for the ***Yudhiṣṭhira*** Era, the scholars declare that ***Varāhamihira*** gives this as the date of the ***Mahābhārata*** war. ***Kalhaṇa*** also assumes that the position of ***saptṛṣis*** has been given by ***Varāhamihira,*** and makes the same mistake regarding the ***śaka kāla*** in his ***Rājataraṅgiṇi.*** However, he assumes that ***Kaliyuga*** began in 3102 BCE, hence declares that ***Pāṇḍavas*** lived 3102-2449= 653 years after the start of the ***Kaliyuga.*** This has only contributed to the confusion and some Indologists actually declare ***Kaliyuga*** as a figment of imagination.

Varāhamihira simply quotes ***vṛddha Garga's*** opinion regarding when ***Yudhiṣṭhira*** lived and how to get that period from ***śaka kāla*** and *this is not **Varāhamihira's** opinion.* ***Garga*** by all accounts lived before CE and the word ***śaka kāla*** of ***Garga*** cannot refer to ***Śālivāhana śaka*** of 78 CE. The ***śaka kāla or śaka nṛpati kāla in Garga's*** words refers to the era of the ***saka*** king, Cyrus, beginning with 550 BCE. All this has been noted by many scholars[37], and discussed in great detail by Kota Venkatachelam[38] whose work may be consulted for further details. With the correct identification of ***śaka kāla,*** the date given by ***Varāhamihira*** is also consistent with the date of the war given here. It may be noted in passing that it was based on the wrong identification of ***śaka kāla*** that Professor Sengupta felt justified in his date of 2449 BCE for the war. Thus the so called ***Varāhamihira*** tradition and the ***Rājataraṅgiṇi*** tradition of assigning a

[37] Vaidya, C. V.,(1983) The Mahabharata A criticism, Cosmo Publications, New Delhi, p. 80.

[38] Venkatachelam (1954).

date 0f 2449 BCE to the war is based on a mistaken identity for the ***śaka kāla,*** compounded by the mistake in assuming that a mere quotation of ***vṛddha Garga by Varāhamihira*** reflects the latter's own opinion. The date derived here is consistent with ***Āryabhata*** tradition and the correct ***śaka kāla*** beginning in 550 BCE. ***Saptarṣi Era* and Genealogy list from *Purāṇa-s***

The ***Sapta ṛṣi***-cycle is named after the seven sages and is allegorically associated with the Big Dipper, the eastern most star of which is marked by ***marīci*** followed by ***vasiṣṭha, āṅgirasa, atri, pulastya, pulaha and kratu,*** respectively, in that order. The seven sages are thought to move through the twenty-seven ***nakṣatra***-s along the Ecliptic at the rate of one ***nakṣatra*** per 100 years and to complete one cycle in 2700 years. This forms a convenient cycle for reference, but no astronomical significance[39] for the movement and the association of the stars of the Big Dipper can be ascribed. According to ***purāṇa-***s, it is accepted[3402] that ***saptarṣi-s*** were in ***maghā*** when ***Yudhiṣṭhira*** ascended the throne and that the time interval from ***Parikṣit*** to the accession of the ***Nanda*** kings was 1500 years. Between ***Parikṣit*** and the ***Nanda***s, there were three royal dynasties, ***Bṛhadratha, Pradyota and śiśunāga*** families. The ***Nanda***s were followed by ***Maurya***s, ***Sungas, Kaṇvas and Andhras.*** The ***Saptarṣi***s returned to ***maghā*** during the reign of the 24th king of the ***Andhras***. It was the 25th king, ***Gautamīputra Śātakarni*** who performed the ***Asvamedha yāga*** and ***rājasūya yāga.*** It is simply being recalled that the ***saptarṣis*** had returned to the position they had occupied during the time when these rituals had been performed earlier at the time of the ***Pāṇḍavas***. The reason for this remembrance is that during this interval of 1500 years, there had been a decline of Vedic performances due to the ascendancy of Buddhism especially during the reign of the king ***Aśoka Maurya.*** Since 1500 years had passed till the time of ***Nandas, Aśoka Maurya's*** time must have been about a

[39] This is the reason why ***Varāhamihira*** simply quotes ***Garga*** regarding the position of ***saptarṣis*** and does not express his own opinion of it. It may also be noted that the two stars, ***kratu and pulaha***, 'the pointers', point toward the polestar Polaris, now. But the situation was different in 3000 BCE. Then the pole star was Thuban (***dhṛva***) and the entire ***saptarṣi maṇḍala*** was circumpolar and the two leading stars did not point to the then polestar

[40] A detailed discussion of these points are given by Kota Venkatachelam and summarized by Vedavyas.

hundred years later, i.e., (3100-1500-100=)~ 1500 BCE. The ***Andhra***s were followed by the ***Guptas*** and the ***Pramara***s. In the accounts given by historians there is a mix up of the ***Gupta*** king, ***Samudra Gupta***, who was also known as ***Aśokāditya Priyadarśin*** and lived around 320 BCE, with ***Aśoka*** of the ***Maurya*** Dynasty, which dynasty had ruled ***Magadha*** from 1535 BCE - 1219 BCE.. The celebrated inscriptions of ***Priyadarśin,***–Rock Edicts III and XIII-mention Antiochus and Ptolemy as contemporaries of ***Priyadarśin,*** who is ***Samudra Gupta*** of the ***Gupta*** Dynasty. The ***Gupta*** Dynasty ruled ***Magadha*** from 328 BCE- 83 BCE and not the ***Mauryas.*** This confusion is the reason for assigning the wrong date for the ***Mahābhārata*** war based on the ***Purāṇic*** genealogy lists. The confusion in the chronology of ***Bhārata*** is compounded by the historians, who mis-identify King ***Vikramāditya*** of the ***Pramara*** Dynasty[41], who established the ***Vikram*** Era in 57 BCE. The ***Vikrama*** Era together with the ***saptarṣi*** tradition will be discussed in greater detail later.

When proper identification of ***Aśoka*** is made, it is seen that all the traditions, namely,

(i) ***Āryabhata's Kaliyuga,***

(ii) ***saptarṣi*** tradition and

(iii) the ***Purāṇic*** tradition are all consistent with the date 3067 BCE for the war.

VII. B. Internal consistency in the Epic of the Date of 3067 BCE.

It is necessary to resolve some misconceptions that have been floating around the various events in the epic such as

(i) the war started on an ***amāvāsya*** day,

(ii) there was a conjunction of ***śani*** and ***Bṛhaspati near viśākha and***

[41] Ed.see the Dynastic Lists in th Appendix

(iii) there were retrograde motions of Mars near ***maghā*** and that of Jupiter ***near śravaṇa.***

It is also necessary to assure the consistency of the chronology for various events as simulated in the year 3067 BCE (which is identical to the chronology given earlier by Raghavan) with those described in the epic. It turns out that this consistency requires an ***adhimāsa*** in that year and further brings up a question about the actual number of days between the fall of ***Bhiṣma*** and his final departure. According to the simulation, the interval appears to be 48 days (same as the number of days given by Raghavan) where as all scholars proclaim that he spent 58 sleepless nights. All these issues have to be satisfactorily resolved.

The question of *adhimāsa*

The fact that for the months and dates to be consistent, the year 3067 BCE requires an ***adhimāsa,*** and according to Dr. Mohan Gupta[42], this is not possible for the year 3067 BCE. However, this objection was based on the use of the methodology based on the current ***Sūryasiddhānta*** and is not applicable to the date in question. At the time of ***Mahābhārata ,*** the methods followed were based on ***vedāṅga jyotiṣa*** (pre-***Lagadha,*** in fact), and the method of determining the ***adhimāsa*** was based on observations and was called the ***śunaśṣepha*** method[43]. The author has shown[44] that there was indeed an ***adhimāsa*** that year just as required.

How many sleepless nights did *Bhiṣma* spend?

Following the ***chronology*** given by Professor Raghavan, which is identical to the chronology

---

[42] Dr. Mohan Gupta, IAS (Retd.) The Date of Mahabharata War On the second day, of the Mythic Society conferenceDr. Mohan Gupta (Ujjain) dealt with *Puranic* and Astronomical evidences. Based on genealogical and astronomical calculations he concluded that 17th October 1952 B.C. Thursday, *Marga Krsna Amavasya kali* 1157 or *shakapurva* 2029, Julian year 2762 as the date when the *Mahabharata* war began.

[43] P.V.Holay Year of Kaurava Pandava war, Kamath(2004)

[44] Achar,

given in this article, then there are only 48 nights after the fall of ***Bhīṣma*** on the tenth day to his final departure after the arrival of winter solstice. Professor Raghavan explains that the count of 58, (which is generally accepted as the number of sleepless nights that ***Bhīṣma*** suffers), includes the ten days during which he led the ***kaurava*** army and that he could not sleep because of the stresses involved. His argument is based on a somewhat different translation of the ***śloka*** in the epic than the one generally followed. This appears to be a reasonable explanation of this apparent discrepancy.

Did the war begin on an *amāvāsya*?

Scholars who insist that the war began on ***amāvāsya,*** base their conclusion on the message sent by ***Kṛṣṇa*** through ***Karṇa:***

saptamāccāpi divasād amāvāsyā bhaviṣyatiŚ

sangrāmo yujyatāṁ tasyāṁ tāmāhuḥ śakradevatāṁŚŚ MB(V.140.18)

Some scholars have interpreted this to mean that ***Kṛṣṇa*** declared the war to start on the ***amāvāsya day***. According to the norms, the war could de declared either by ***Yudhiṣṭhira*** or by ***Duryodhana*** only and not by anybody else. ***Kṛṣṇa*** sends the message to ***Bhiṣma and Droṇa,*** and not to ***Duryodhana***. Neither ***Bhiṣma nor Droṇa*** could start the war on their own. It is clear therefore, that this cannot be a declaration of war. The actual declaration of the war is made when ***Duryodhana*** sends ***brāhmaṇas to Yudhiṣṭhira.*** The proper translation of the above sloka is that war rituals or preparations for the war be started on that day and not the war itself. Furthermore, there is the graphic description of the war on the fourteenth day, when the battle continues into the night, breaking all rules; ***Ghatotkaca*** is killed and the battle stops only briefly in the wee hours of the morning just as the moon rises. If the war had started on an ***amāvāsya***, it would be ***suklapakṣa*** on the fourteenth night and the moon would not rise early in the morning. **The supposed conjunction of *śani and Bṛhaspati***

This configuration has been considered to be an important planetary configuration by some scholars on the basis of the following:

saṁvatsara sthāyinau ca grahau prajvalitāvubhauŚ

viśākhāyoḥ samipasthau bṛhaspati śanaiścarauŚŚ MB(VI. 3. 25)

This ***śloka*** is part of the third segment of the omens predicting the destruction of the two armies described by ***Vyāsa*** to ***Dhṛtarāṣtra***. As explained earlier, the ***śloka*** previous to this declares

"grahau tāmrāruṇaśikhau prajvalitāvubhau" MB (VI. 3. 24)

"These two "grahas" with blazing coppery red hair", which can only refer to comets. Thus this is not a planetary configuration

The alleged retrograde motions of Mars and Jupiter

maghāsu aṅgārako vakraḥ śravaṇeca bṛhaspatiḥ ĪĪ (MB IV. 3. 13)

This verse in ***Bhīṣmaparvan*** has been interpreted by many a scholar to indicate the retrograde motion of ***Mars at makhā nakṣatra*** and that of Jupiter at ***śravaṇa***. In order for the stated retrograde motion of Mars, the Sun has to be near ***śatabhiṣa*** and for Jupiter to be retrograde at ***śravaṇa,*** the Sun has to be near ***puṣya.*** Of course, such configurations cannot occur at the same time and hence this verse has been considered a prime example of the inconsistency of astronomical references in the Epic. As explained earlier, this verse is also part of the third segment of omens and this refers to comets, which belong to the families of Mars and Jupiter respectively, and not to planetary positions.

VIII. Date of *Kṛṣṇa*.

According to the Epic ***Mahābhārata ,*** the character of ***Kṛṣṇa*** first appears at the time of ***Draupadī's*** wedding and his departure is exactly 36 years after the war. No information about his birth is available in the Epic itself, although there is information about his departure. ***Kṛṣṇa***

observes omens[36][45] similar to the ones seen at the time of the ***Mahābhārata*** war, now indicating the total destruction of the ***Yādavas.*** Simulations show that in the year 3031 BCE, thirty-six years later than 3067 BCE, there was an eclipse season with three eclipses. A lunar eclipse on October 20 was followed by an annular solar eclipse on November 5, followed by a penumbral lunar eclipse on November 19, within an interval of 14 days and at an ***'aparvaṇi'*** time. Thus the date of departure ***of Kṛṣṇa*** is consistent with the popular tradition that he passed away after 36 years after the war. The information about his birth can be gathered from ***Harivaṁśa*** and ***Bhāgavata Purāṇa.,*** according to which he was born in ***kṛṣṇa pakṣa aṣṭamī*** with ***rohiṇī nakṣatra,*** but there is an uncertainty about how long he actually lived. Some believe that he lived for 125 years, while others take his life span to be only 105 years. Raghavan assigns only 81 years. The date of birth of ***Kṛṣṇa*** is calculated, apparently by extrapolation from the date of departure and so also are the several 'horoscope's of ***Kṛṣṇa.*** Simulations based on the dates yield results which only go to show whether the calculations had been done accurately and correctly by those who give such 'horoscope's. As there is no clearly independent piece of information, in the Epic, which can be used for distinguishing the dates, one may accept that date which suits the tradition of choice. It should be understood, however, that the date of his departure from this world can be established on the basis of information in the Epic and demonstrated by the simulations.

IX. Consistency with the dates of other Vedic texts

It will be interesting to verify astronomical information contained in other Vedic texts and determine the dates based on simulations using planetarium software and to see if these dates are consistent with the date of ***Mahābhārata*** **.**

For example, based on the astronomical information from ***Rgveda,*** Sengupta[46] inferred a solar

---

[45] ***Caturdaśi pañcadaśi kṛteyaṁ rāhuṇā punaḥ Ī tadāca bhārate yuddhe prāptacādya kṣayāya naḥ ĪĪ MB XIV. 3. 17 ĪĪ***

[46] Sengupta (1947) p. 120

eclipse on July 26, 3928 BCE. Figure 10 shows the star map for this date. As verified by the software RedShift, it is a central solar eclipse, which occurred two days after the summer solstice that year, as per Sengupta's conjecture. However, some caution must be exercised. As has been discussed in detail by the author[47][38] in the planetarium software, the positions of the planets and the stars are computed using the latest theories and information available and they are highly reliable. However, there is uncertainty when it comes to determining eclipses on dates extrapolated to 4000 BCE. These uncertainty which may amount to about 15 minutes when extrapolated to dates around 1000 CE, jumps to more than 12 hours for the time of the occurrence of the eclipse when extrapolated to 3000 BCE, and even more when taken to 4000

[47] See the references in footnote # 17 and #25.

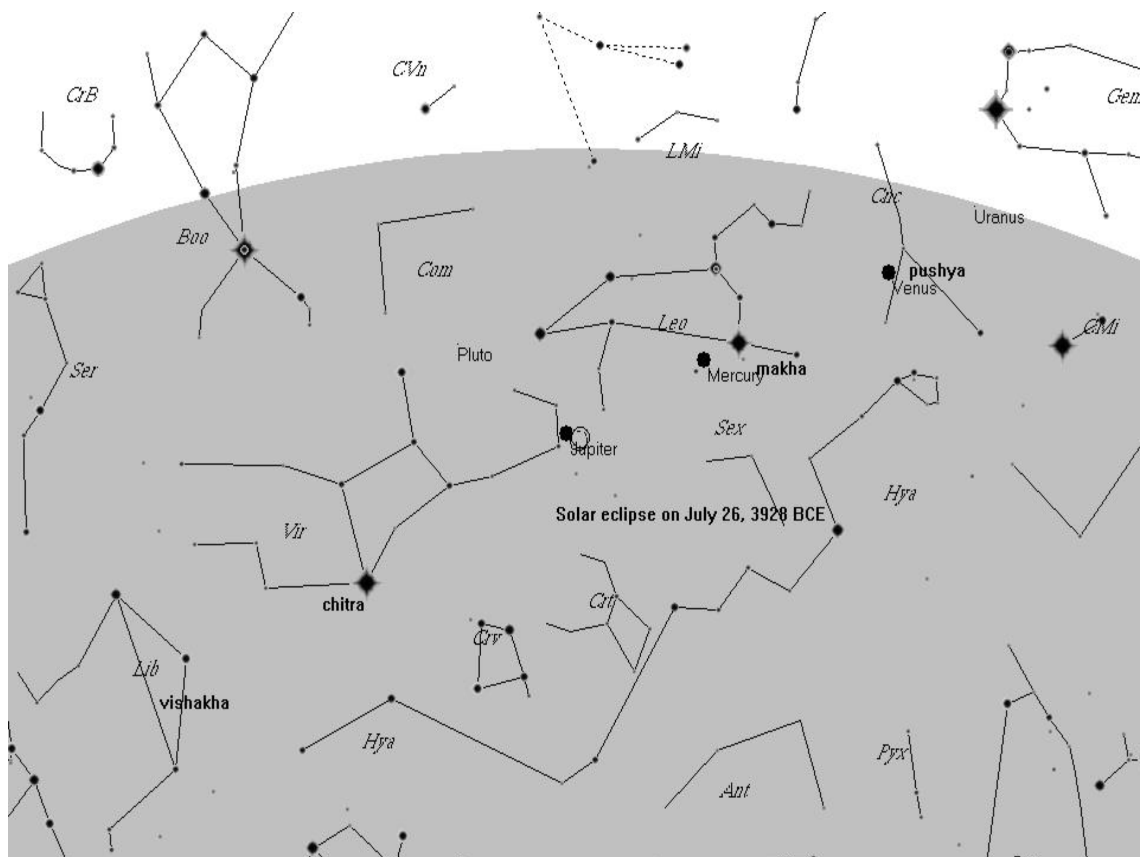


Figure 10 Star map of July 26, 3928 BCE

BCE. The exact location of the eclipse and the exact time of visibility are uncertain, but the occurrence of the eclipse itself is certain. As a consequence, determining the date on the basis of eclipse data alone is risky. However, the eclipse data can be used as secondary information to confirm that it occurred on a particular date. ***However, there are other astronomical data available in the brāhmaṇa*** texts. For example***, śatapatha brāhmaṇa*** refers to ***kṛttikā-s*** rising exactly in the east. On the basis of simulations using the planetarium software[48], the date of the event referred to has been shown to be 2925 +/- 100 BCE, quite in agreement with Dikshit.[49] Considering that this text is attributed to ***Yājñavalka,*** a disciple of ***Vaiśaṁpāyana,*** who is an important narrator of the epic, the date of 3067 BCE for the war is consistent with the date of ***śatapatha brāhmaṇa.*** The author has shown[50] (also on the basis of simulations using the planetarium software) that ***Lagadha***'s ***vedāṅga jyotiṣa*** should be dated to be about ~1800 BCE. The astronomy followed at the time of the ***Mahābhārata*** war is ***vedāṅga jyotiṣa,*** but is very much pre-***Lagadha.*** The date of ***Lagadha' s vedāṅga jyotiṣa*** is also consistent with the date of the war. It may be noted in passing that ***śatapatha brāhmaṇa*** mentions both ***Parikṣit and Janamejaya.*** This is an independent check on the date of the war. A passage in the ***pañcaviṁśa brāhmaṇa (***XXV. 15.3) connects ***Janamejaya*** with the ***sarpayāga*** and has been referred to by Raychaudhuri[51]. The date of a solar eclipse mentioned in this ***brāhmaṇa*** text has been determined by Sengupta[4523] to be September 14, 2451 BCE. Figure 11 shows the star map for this day confirming the calculations of Sengupta. This date, which is about 600 years later, is

---

[48] Narahari Achar, B. N., (2000) " On the Astronomical Basis of the Date of Satapatha Brahmana: A reexamination of Dikshit's Theory", Indian Journal of History of Science, 35(1),pp. 1-19.

[49] Dikshit, S. B.

[50] Narahari Achar, B. N., (2000), "A case for Revising the Date of Vedanga Jyotisa,", Indian Journal of History of Science, 35.3, pp 173-183.

[51] Raychaudhuri, H. C., (1923), Political History of Ancient India, University of Calcutta, Calcutta, p.10.

[52] Sengupta, P C, (1947)

consistent with the date of the war and the date of the other ***brāhmana*** texts.

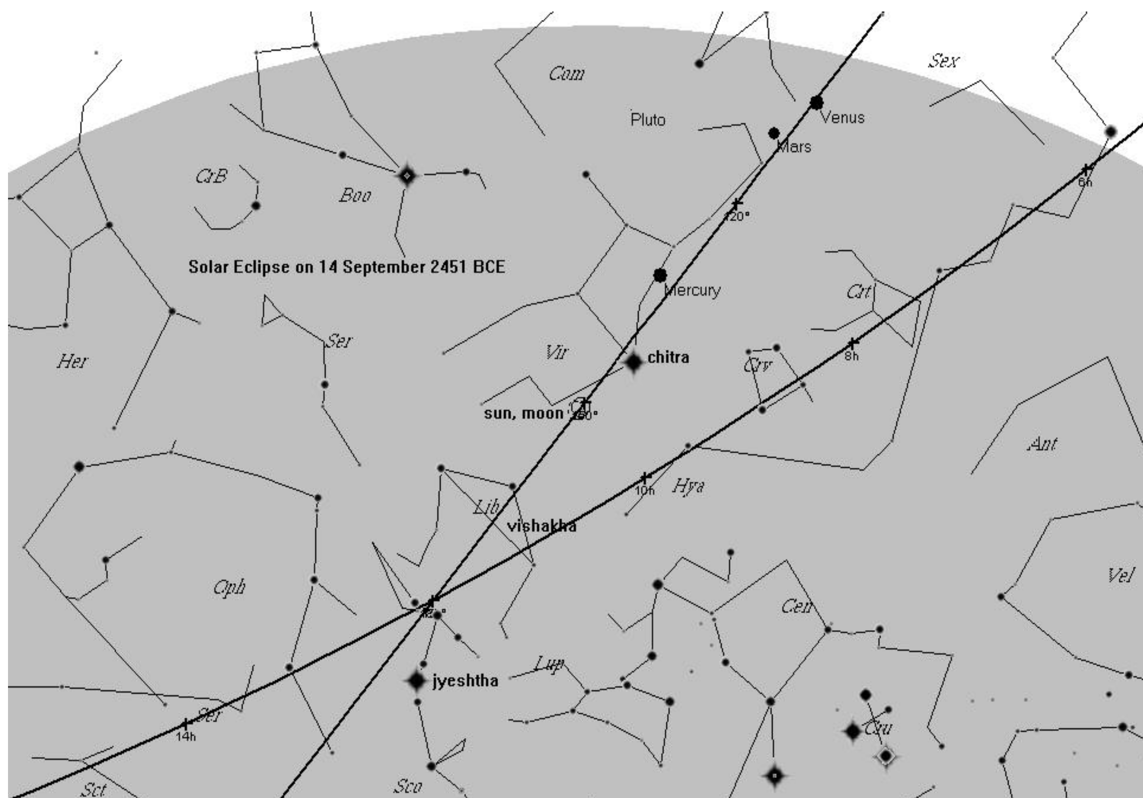


Figure 11 Star map of September 14, 2451 BCE

X. Janamejaya's Inscriptions

Several copper plate inscriptions declaring grants of land and other gifts made at the time of ***sarpa yāga of Janamejaya*** have been discovered. While there are questions about the authenticity of these plates, it will be interesting to see if the simulations based on planetarium software are consistent with the dates.

Inscription I

In one of the inscriptions[53], it is declared that in the 89th year of ***"jayābhudaya"*** era, at the time of solar eclipse in the ***'sahasya'*** month at the time of the '***sarpa yāga'*** a certain gift is made. Considering that this date would refer to the 89th year of ***Kaliyuga***' as explained by the scholar Dr. Vedavyas, it would be 3014 BCE, and ***'sahasya'*** would be the second month in ***hemantaṛtu.*** Figure 12 shows the star map for November 27, 3014 BCE, which is a solar eclipse day and Figure 13 shows the full moon on December 11, 3014 BCE to occur near ***puṣya***, the month[54][45] corresponds to '***sahasya***' just as required.

A note of caution has to be mentioned again at this stage. As has been discussed earlier, the positions of the planets and the stars are computed in the planetarium software using the latest theories and information available and they are very reliable. However, there are uncertainties when it comes to determining eclipses on dates extrapolated to 3000 BCE. These uncertainties may amount to as much as 12 hours for the time of the occurrence of the eclipse. For example, the time of occurrence is given as 3:00 a.m. for the eclipse on November 27, 3014

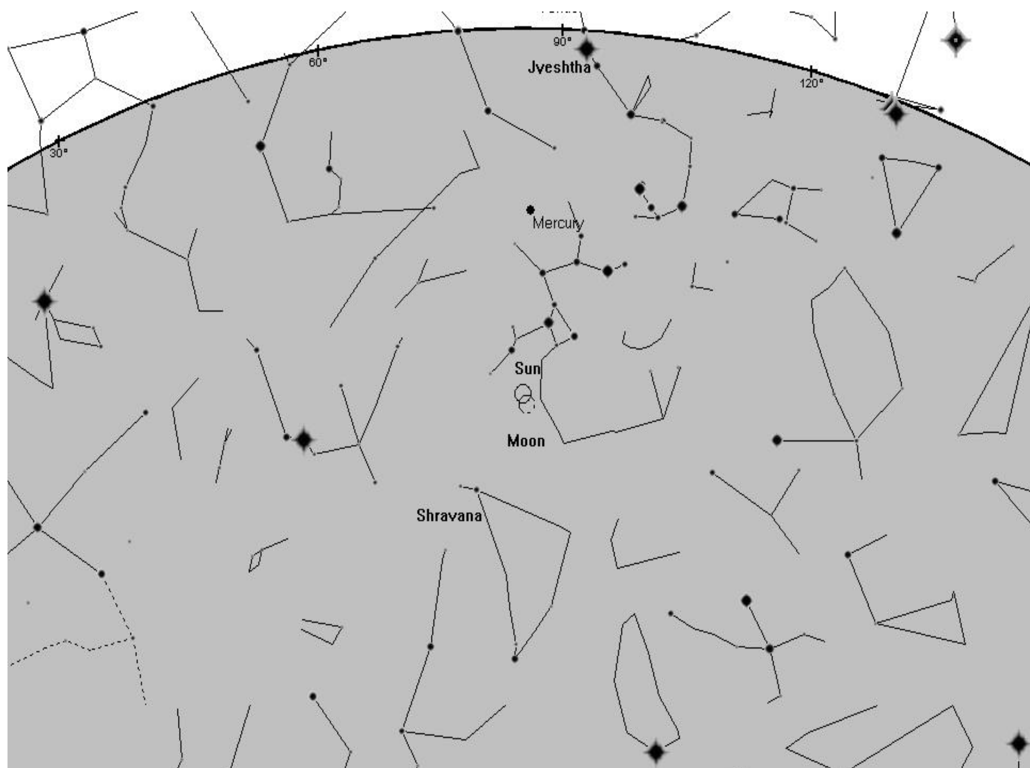
[53] Bhimanakatte Math Inscription No. 139, given as Janamejaya's Inscriptions I by E.Vedavyas in footnote 22

[54] It should be remembered that the months were ***purnimanta*** months

BCE with the uncertainty of several hours. What is certain, however, is that a solar eclipse did occur on November 27, 3014 BCE. Figure 13 corroborates to the month given in the inscription. The same caution applies to the solar eclipse on September 14, 2451 BCE also.

It may be noted that this inscription of ***Janamejaya*** was rejected as not being authentic on the grounds that the astronomical data it contained would not stand 'the test of critical examination.' However, the planetarium software has shown that the eclipse, month and the year in the Inscription are all reproduced thus establishing its veracity.

Figure 12 Star Map of November 27, 3014 BCE



Inscription II

There is a second inscription, which refers to a ***'digvijaya',*** an expedition of conquest of the south by ***Janamejaya.*** According to the inscription, the Lord of ***Hastināpura*** makes a certain grant on the occasion of ***vyatipāta yoga*** in ***uttarāyaṇa caitra māsa kṛṣṇapakṣa***. According to the text of the Inscription quoted by Dr.Vedavyas,[4556] it reads, ***"…śrī harihara deva sannidhau kaṭakaṁ utkalita caitramāse kṛṣṇāpakṣa somadine bharaṇi mahānakṣatre saṁkrānti vyatipāta nirmita samaye sarpayāgaṁ karomi."*** There is no mention of a partial solar eclipse anywhere in the text. Dr.Vedavyasa has inferred ' having conquered Kataka (Orissa Cuttack?)' from the words '***kaṭakaṁ utkalita'***. However, in the context, this does not appear to be the meaning. The ***vyatipāta yoga refers*** to an ***amāvāsya*** on a Sunday, when the moon is in ***aśvini, ārdrā, śravaṇa, dhaniṣṭhā, or*** in the first quarter of ***āsleṣā.*** The text is really referring to the next day, ***'somadine'***. Since the ***nakṣatra*** referred to is ***bharaṇi,*** the previous day must have been ***aśvini,*** and the combination with ***amāvāsya*** and ***ravivāra*** created the ***vyatipāta yoga.*** The word ***'utkalita'*** 'blossoming', qualifies '***caitramāse kṛṣṇapakṣe'***, making the '***somadina'*** the first day of ***śuklapakṣa.*** The word '***kaṭakaṁ'*** really qualifies '***sarpayāgaṁ'*** because of the ending, and means well bounded or fortified in the context. The occasion is therefore, the well protected '***sarpa yāga'*** being performed on Monday of ***bharaṇi nakṣatra*** following the ***amāvāsya*** Sunday of ***aśvini nakṣatra*** which created the ***vyatipāta yoga,*** one which has to be avoided in performing auspicious rites.

[55] Vedavyas, E (1995) Appendix IV , page 321

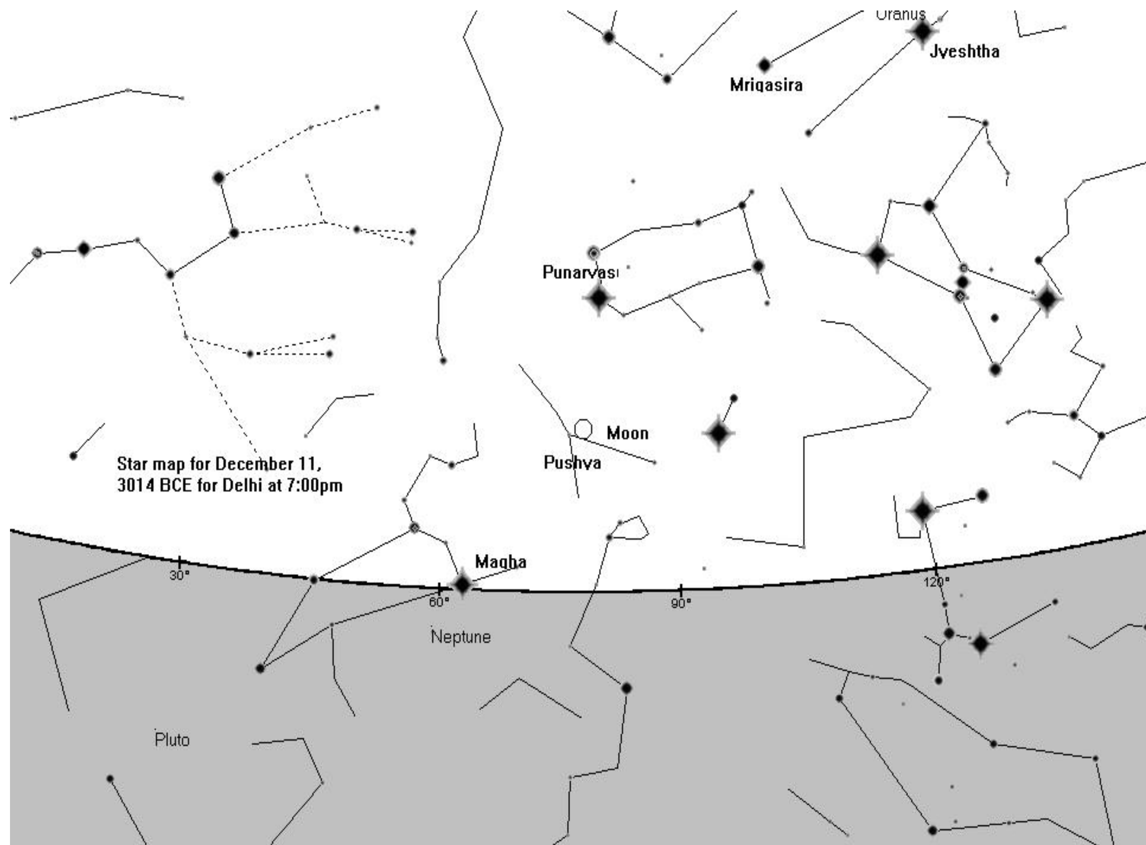


Figure 13 Star map of Dec 11, 3014 BCE

Inscription III

An inscription almost identical to the one above in the preamble and labeled III by Vedavyasa was also issued at the time of the commencement of the ***sarpa yāga***. A second inscription under the same label III records the date as ***caitra kṛṣṇa pakṣa tritiya tithi, viśākha nakṣatra, saṅkrānti and vyatipāta yoga*** and records[47] the grants that were made

[47] This is recorded as one of kupparagadde plates in Indian Antiquary of 1901.

on this occasion. Figure 14 shows the star map for March 6, 3014 BCE at sunrise and shows the ***vyatipāta yoga.*** Figure 15 shows the next day of ***bharaṇi*** the beginning of ***sarpayāga.***

It appears that a large number of copper plates inscriptions attributed to ***Janmejaya*** are available, but not all of them have enough independent information for simulation and

confirmation. Some of them refer to a partial solar eclipse at the time of ***uttarāyana saṅkramaṇa.*** In fact simulations show that there was indeed a solar eclipse on January 5, 3104 BCE and the winter solstice was on January 13, 3104 BCE. In any case there is consistency with the two inscriptions selected above for the detailed information in them.

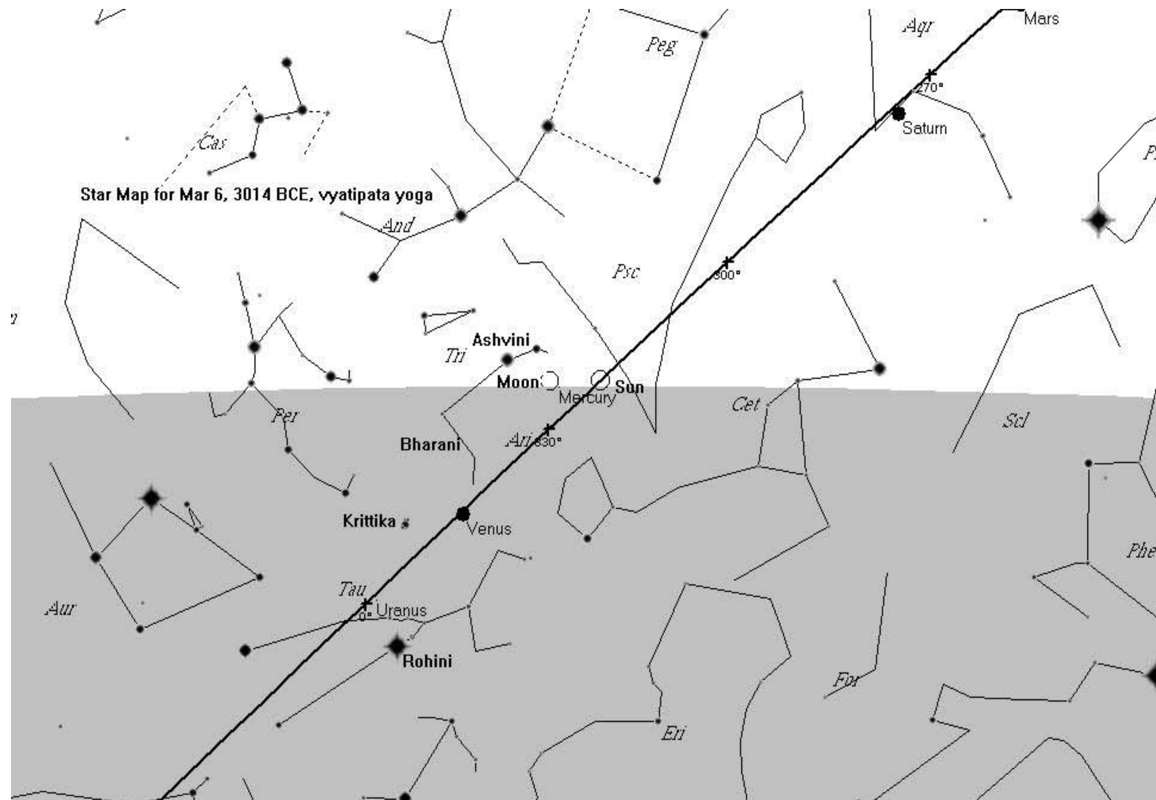


Figure 14 star map for March 6, 3014 BCE

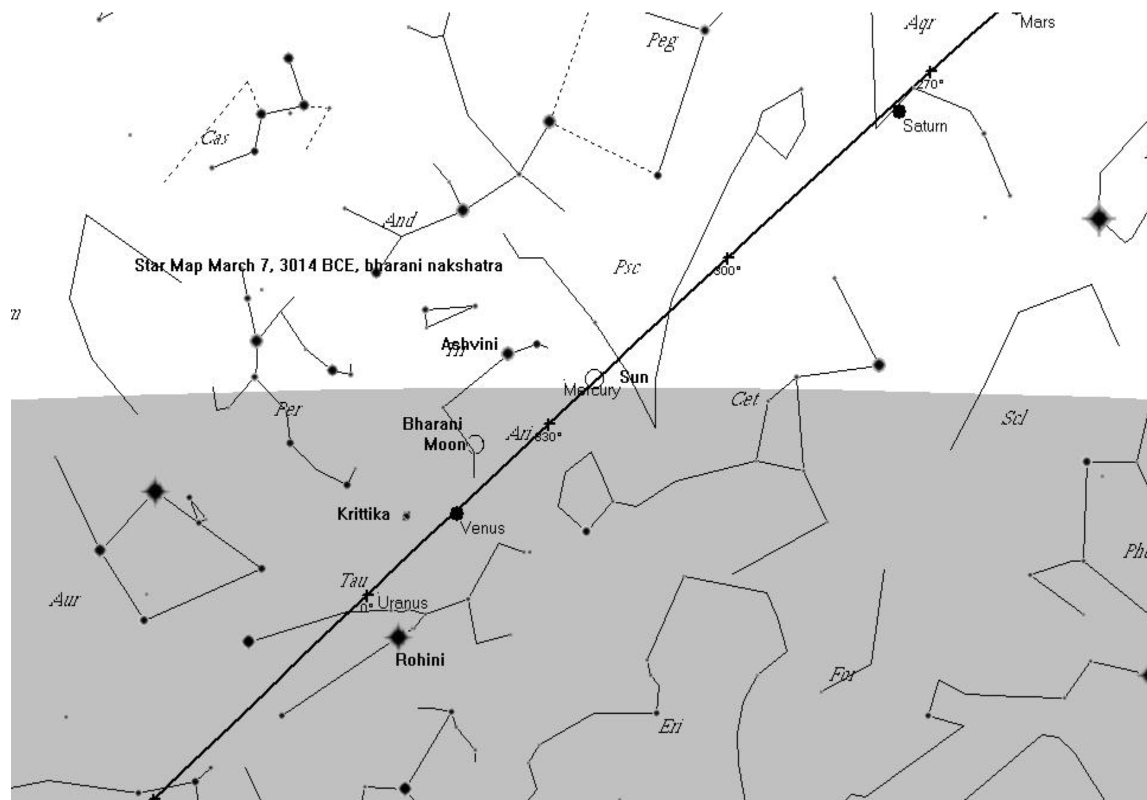
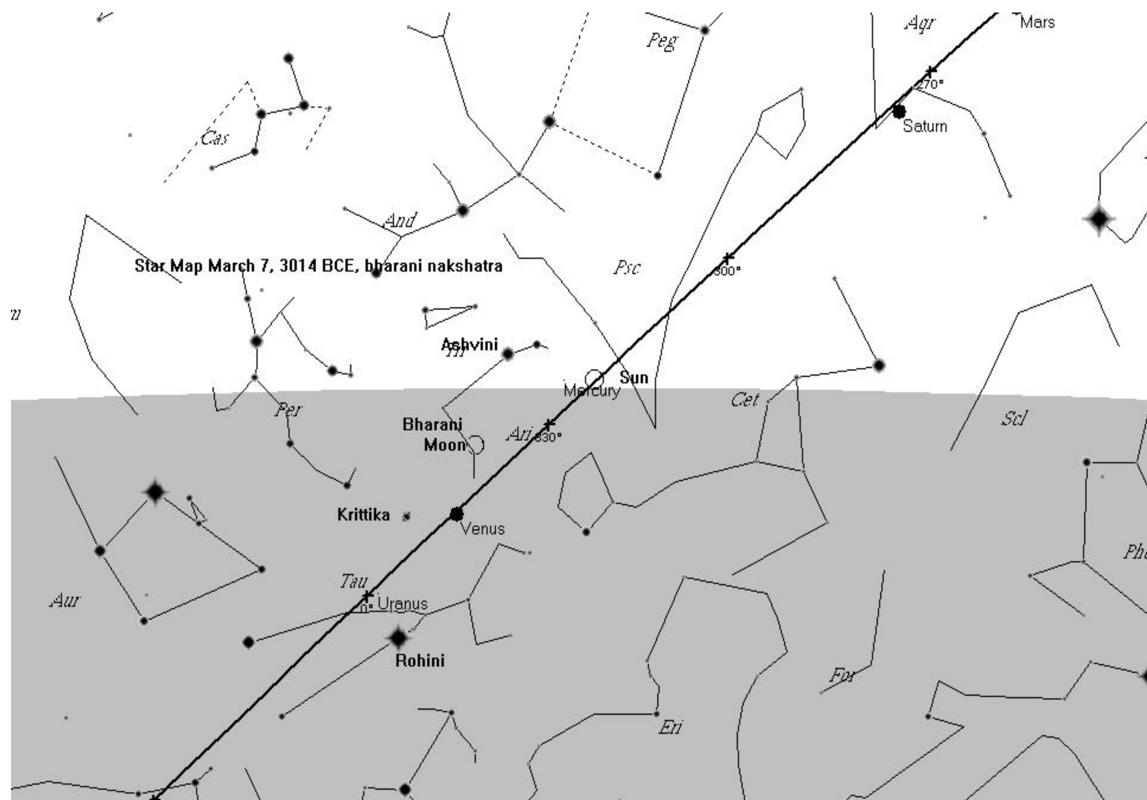


Figure 15 shows the next day of ***Bharani*** the beginning of ***sarpayaga.*** March 6, 3014 BCE



XI Buddha's Date

One consequence of the mix up of the names of ***Aśokāditya*** of the ***Guptas*** with ***Aśoka*** of the ***Maurya***s is the misdating of ***Buddha.*** According to ***Purāṇic*** evidence, there had expired 1500 years after ***Parikṣit***, when ***Mahāpadmananda*** was coronated. Between ***Parikṣit*** and the ***Nanda***s, there were three royal dynasties, ***Bṛhadratha, Pradyota and Sisunaga***[56] families. The ***Nanda***s who ruled ***Magadha*** for 100 years, were followed by ***Maurya***s, ***Sunga, Kaṇva and Andhras. Candragupta*** founded the ***Mauryan*** dynasty with the help of ***Cāṇakya.*** His son was ***Bimbisāra*** and grandson was ***Aśokavardhana.*** The ***Maurya-*** s ruled for a total of 316 years and were replaced by the ***sunga-***s. The ***Kaṇva-***s who succeeded the ***Sunga-***s were themselves supplanted by the ***Andhra-***s, who ruled for a total of 506 years. Then followed the reign of ***śrīgupta-s*** for a period of 245 years. This age has been termed the 'Golden Age' in the history of ***Bhārata.*** It is ***Samudragupta*** of the ***śrīgupta*** dynasty who was known as "***Aśokāditya Priyadarśin***" The "Inscriptions of ***Aśoka***" belong to this ***Gupta*** emperor and not to ***Aśoka Maurya*** , who came to power after 218 years after ***Buddha.***

Buddha was the son of King ***Suddhodana*** who was the 23rd king of ***the Ikṣvāku*** dynasty and ***Purāṇic***-records point to 1807 BCE as the date of attaining ***nirvāṇa by Buddha.*** Just as in the case of ***Kṛṣṇa,*** it appears that his date of birth is calculated after determining the date of ***parinirvāṇa*** (final departure). ***Buddha's nirvāṇa***

Kota Venkatachelam has determined that ***Buddha's nirvāṇa*** occurred on the ***vaiśākha Pūrṇimā,*** on March 27, 1807 BCE. Simulations show that astronomically this is indeed the situation as shown in Figure 16. Many other scholars also agree as to the date of ***Buddha's nirvāṇa.***

Support for this date is derived from an independent Buddhist source, ***saṁyutta nikāya.*** For about three months before his death, ***Buddha*** was staying in ***śrāvasti.*** During this time there occurred the winter solstice, a lunar eclipse, followed by a solar eclipse. Simulations show that the winter solstice occurred on January 5, 1807 BCE. There was a lunar eclipse on January 26,

---

[56] Editor –see Dynastc lists inn Appendix D

1807 BCE, which was followed by a solar eclipse on February 10, 1807 BCE, as shown in Figures 17 and 18. It can also be seen from Figure 18 that winter solstice occurred earlier when the Sun was near ***dhaniṣṭha*** (the position which corresponds to 270 degrees along the ecliptic). This is exactly as recorded[48] ***in saṁyutta nikāya, Part I, Sugātha-Vagga,*** Book II, Chapter I, ***Devaputta-saṁyuttam, sutta-s 9, and***

10.

It is interesting to compare these simulations with the calculations of Professor Sengupta, who was trying to confirm which of the usual dates, 544 BCE or 483 BCE is to be 'accepted' for the event of ***Buddha nirvāṇa.*** He found that two eclipses as mentioned in the ***saṁyutta nikāya*** would be possible in 560 BCE, however this would be in conflict with the dates 483 BCE and 544 BCE which have been touted as possible dates of ***Buddha's nirvāṇa.*** Professor Sengupta considers 544 BCE to be the better date as it is closer to 560 BCE. However, the proper conclusion should be that neither of these dates

[48] ***Atha kho bhagavā caṅdimaṁ devaputtaṁ ārabha rāhuṁ asuriṅdaṁgāthayā ajjabhāsi ĪĪ***
thatāgataṁ arahaṅtaṁ Ī caṅdimā saraṇaṁ gato ĪĪ
rāhu caṅdaṁ pamuñcassu Ī Buddha lokānukaṁpakāti ĪĪ SN (I. ii . 1. 9.3) ĪĪ
Atha kho bhagavā suriaṁ devaputtaṁ ārabha rāhuṁ asuriṅdaṁ gāthayā ajjabhāsi ĪĪ
thatāgataṁ arahaṅtaṁ Ī suriyaṁ saraṇaṁ gato ĪĪ
rāhu pamuñca suriyaṁ Ī Buddhā lokānukaṁpakāti ĪĪ SN (I. ii . 1. 10.3) ĪĪ

are the correct ones according to ***saṁyutta nikāya.*** But, 1807 BCE is consistent with the eclipse data.

It should be pointed out that a search from 1900 BCE to 400 BCE for the set of astronomical data, namely, winter solstice, lunar eclipse, solar eclipse followed by ***vaiśākha purṇima***, yields about a dozen dates: 1807 BCE, 1694BCE, 1659BCE, 1564BCE, 1510BCE, 1250BCE, 1192BCE, 1138BCE, 1119BCE, 1062BCE, 1007BCE, 765BCE, 690BCE and 560BCE. If the restriction of a time

limit of about three months is imposed, the last three do not qualify, leaving only the dates prior to 1000 BCE. The astronomical information is not sufficient to further narrow the possible choice. It is interesting to note that the 'traditionally' accepted dates, 544 BCE or 483 BCE do not fit the picture, neither do the recently revised later dates.

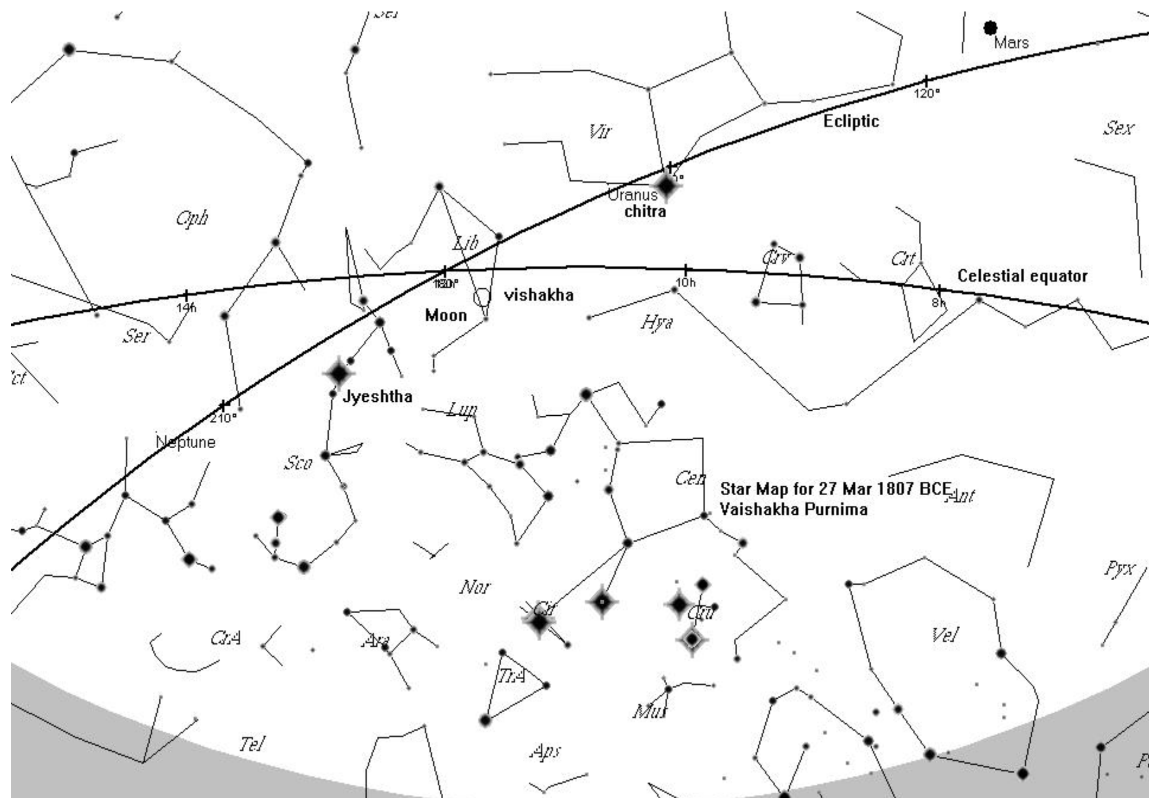
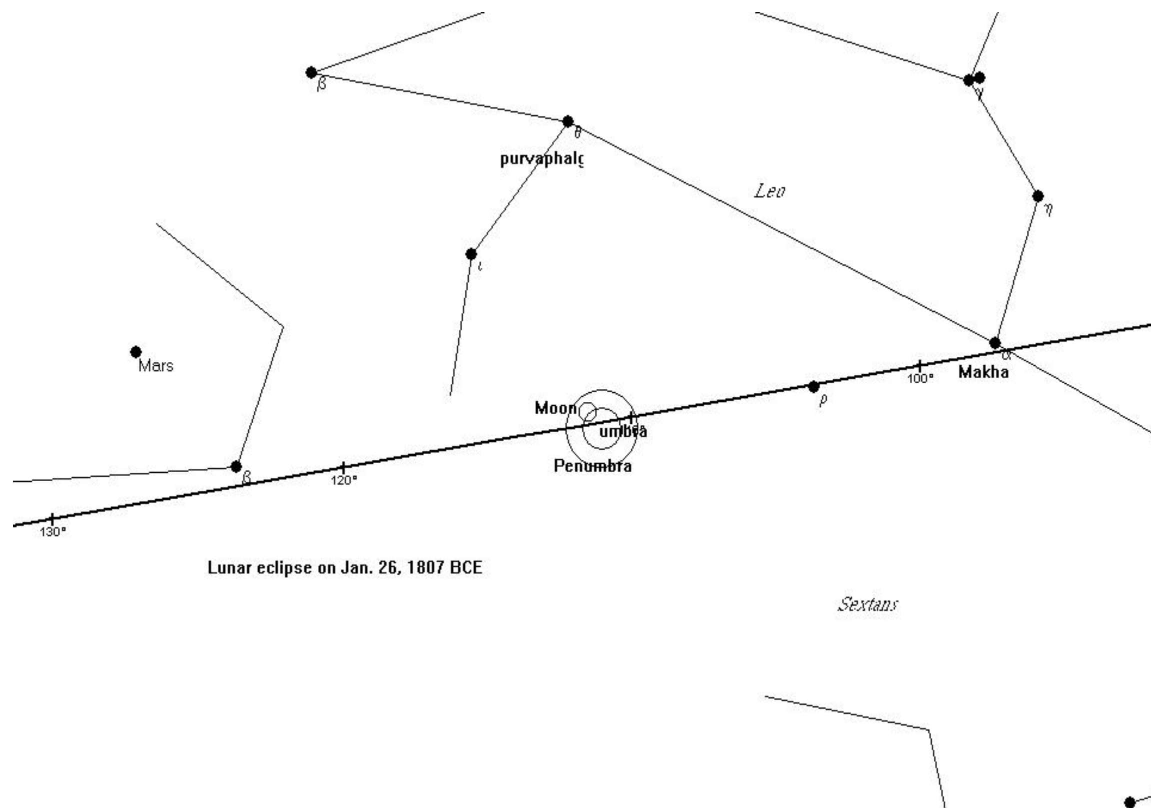


Figure 16. ***Buddha's nirvāṇa*** March 27, 1807 BCE



Figures 17January 26,1807 BCE

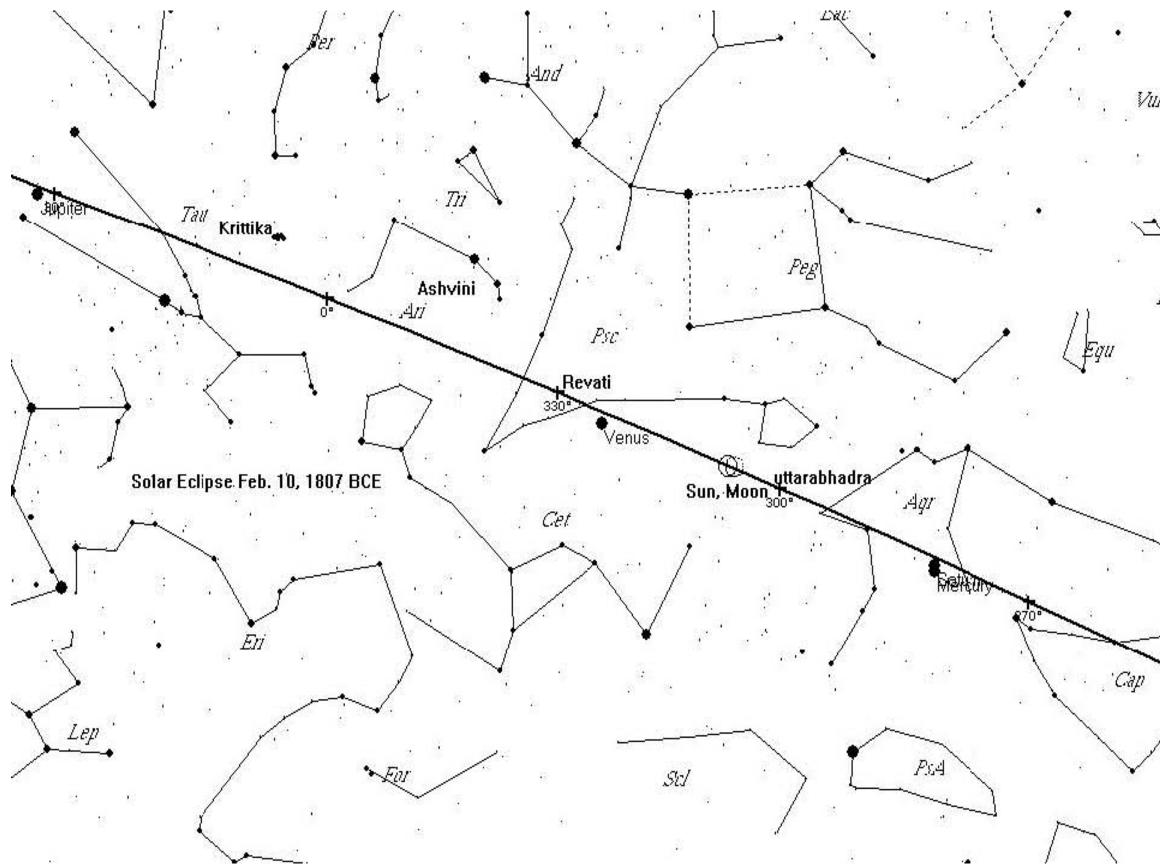


Figure 18 Solar eclipse on February 10, 1807 BCE

Buddha's **Birth**

This has been discussed in great detail by Kota Venkatachelam[57] and by Vedavyas[58], who gives the planetary positions at the time of ***Buddha***'s birth on March 10, 1887 BCE. ***(vaiśākha śuddha pūrnimā, viśākha nakṣatra).*** The simulations for March 10, 1887 BCE (Figure 19) shows that all the planetary positions agree with those given by Vedavyas, but the ***nakṣatra*** is clearly ***citrā*** and not ***viśākha***. The next ***pūrṇimā*** occurs at ***viśākha*** on April 9, 1887 BCE, but some of the

[57] Ibid

[58] Vedavyas (1995)

planetary positions would have changed. Thus the date given by Vedavyas cannot be confirmed using the planetarium software. It appears that the positions of the planets were calculated by Vedavyas, after obtaining the time of Buddha's birth on the basis of Puranic, Buddhist, and Tibetan, Chinese, Ceylonese and Japanese Buddhist sources.

Table. 5. Planetary longitudes at the time of birth of ***Buddha*** according to ***Vedavyas Vaiśākha śuddha pūrṇimā, viśākha nakṣatra, Tuesday at 12:15 p.m. 1887 BCE***

Planet	Longitude	***rāśi***	zodiac sign
Sun	4° 54’	***meṣa***	Aries
Moon	28° 6’	***tula***	Libra
Mars	28° 24’	***mīna***	Pisces
Mercury	10° 30’	***mīna***	Pisces
Jupiter	8° 12’	***kanyā***	Virgo
Venus	23° 24’	***meṣa***	Aries
Saturn	16° 48’	***vṛṣabha***	Taurus
Rahu	15° 38’	***mithuna***	Gemini
Ketu	15° 38’	***dhanus***	Sagittarius
Lagna	1° 2’	***karkātaka***	Cancer

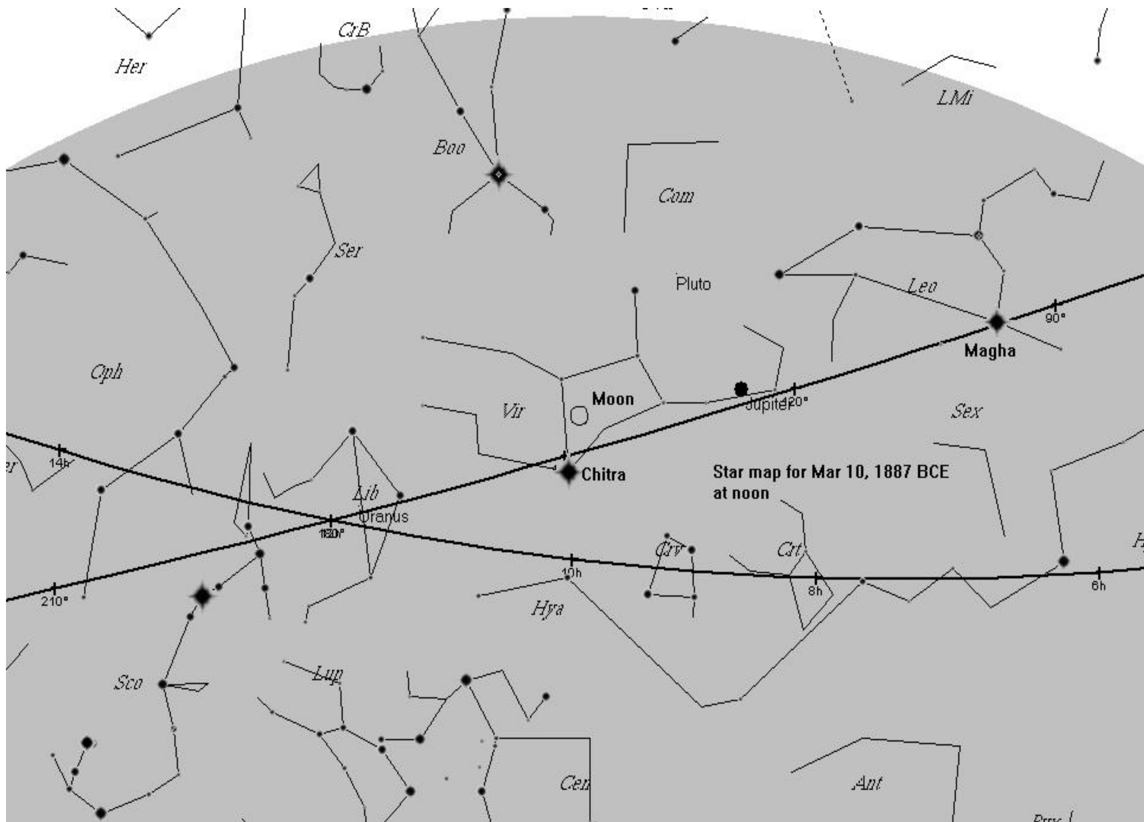


Figure 19 Star map on March 10, 1887 BCE

While the planetary positions other than the moon are correct for this date, the most crucial factor, that the ***nakṣatra*** be ***viśākha*** for ***vaiśākha pūrṇima*** is not satisfied. If on the other hand, the date of April 9, 1887 BCE is selected, the ***nakṣatra*** works out fine. The other planetary positions must be reported as found by these simulations shown in Figure 20. The date given by Rev. P. Bigandet is March 31 1886 BCE. March 30, 1886 BCE is ***viśākha pūrṇima*** as seen by the simulation, but the planetary positions are again different. But if it is agreed that ***Buddha*** lived for eighty years and his ***nirvāṇa*** occurred in 1807 BCE as discussed above, then one can choose April 9, 1887 BCE as the date of his birth.

XII. The Date of *Ādi Śaṅkara*

The date of ***Śaṅkarācārya*** has been discussed in great detail by a very large number of

scholars. For some details the works of Kota Venkatachelam[59] and the essay of Ramachandran[60] may be consulted. For the purposes of the present essay, the planetary

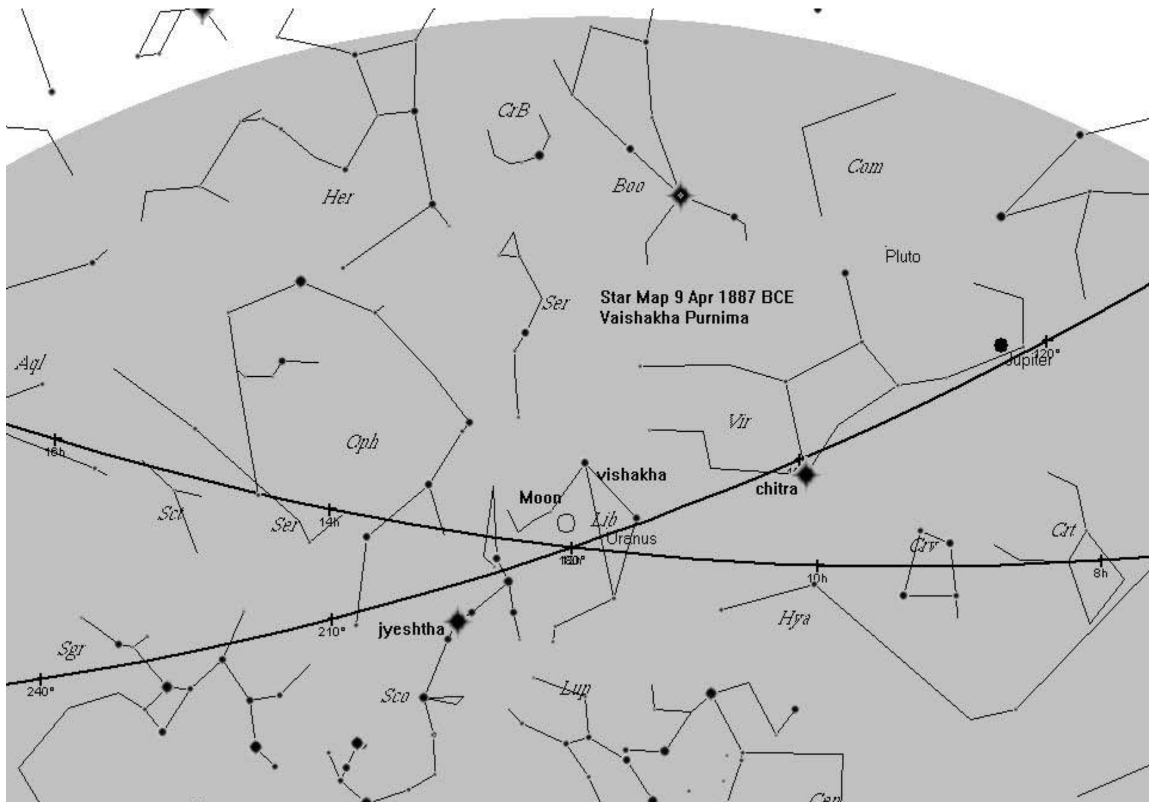


Figure 20 Star Map for April 9, 1887, Vaisakha Purnima

[59] Kota Venkatachelum , (1954) ibid

[60] Ramachandran, V. G.,(1998) ' Date of Adi Sankara' in *Ancient India*, Mahalingam, N., (Ed), International Society for the Investigation of Ancient Civilization, Chennai. Pp.261-304

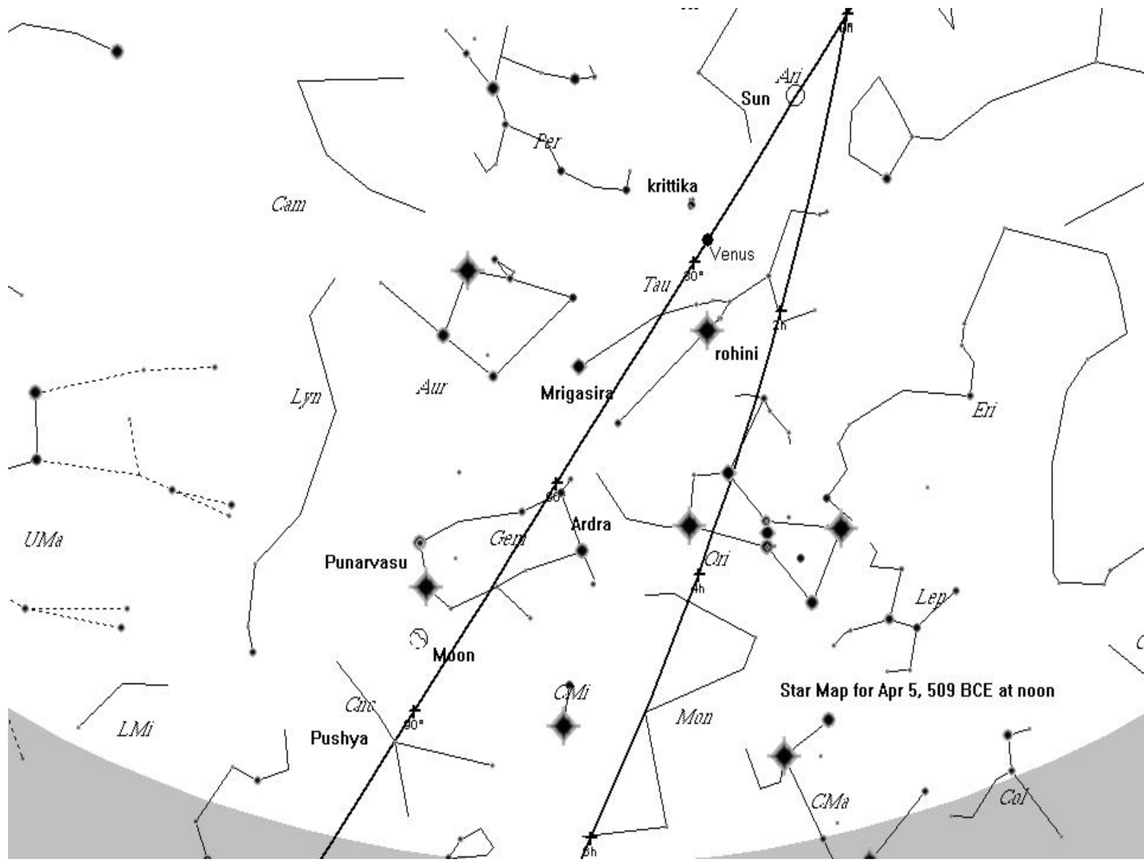


Figure 21 Star map for April 5, 509 BCE

positions at the time of birth of ***Ādi Śaṅkara*** and given in the article by Ramachandran is sufficient. The horoscope is given by ***Citsukhācārya,*** a boyhood friend of ***Śaṅkara,*** in his work ***Bṛhadvijaya***. According to it ***Śaṅkara*** was born in the year ***Nandana*** of ***Kaliyug***a 2593 (509 BCE) in the month of ***viśākha, śuklapakṣa pañcami tithi, punarvasu nakṣatra, karkātaka lagna, in the abhijinmuhūrta***. The Figure 21 shows a star map for April 5, 509 BCE and it is easily seen that ***tithi***, ***lagna, nakṣatra*** and the positions of the planets are exactly as described in the horoscope. This verifies that the planetary configuration as given for that date is correct. However, caution must be exercised in deriving the dates based on horoscopic data alone.

XIII. *Vikrama Saṁvat, Śālivāhana śaka and the Saptarṣi* Tradition

One of the great blunders of historians is to declare that ***Vikramāditya,*** the originator of the ***Vikram*** Era never existed and then to identify ***Chandragupta*** II of the Gupta dynasty who bore the title of ***Vikramaditya***, as the ***Vikramaditya*** and to assign the date of 400 CE for him. Kota Venkatachelam[53][61] has discussed this in great detail. First of all, the Guptas belonged to the ***'sūryavaṁśa'*** and all of them added the title ***'āditya'*** to their names. They ruled ***Magadha*** from 328 BCE- 83 BCE with their capital at '***Pātaliputra'.*** They were contemporaneous with the Greek rulers mentioned earlier. The Greek notices mention ***Pātaliputra,*** and not ***Girivraja*** or ***Rājagṛha,*** which was the capital of the ***Maurya-s*** as has been well known from ***Buddhist*** and other records. After ***Candragupta II***, only four others of the ***Gupta*** dynasty ruled for 150 years and finally, the empire was broken up by the Huns. The Gupta inscriptions are available and their own inscriptions mention ***'Mālava Gaṇa śaka',*** whose date begins with 725 BCE. But, the historians have identified it as the ***Vikram śaka*** of 57 BCE and have changed the ***Gupta śaka*** from 327 BCE to 320 CE, confusing it with ***Vallabhi śaka,*** which started in 319 CE.

The real ***Vikramāditya*** of the ***Vikram śaka*** belongs to the Panwar family, ruled practically the whole of India from ***Ujjain*** and originated the ***Vikram śaka*** in 57 BCE He is the celebrated King whose name is referred to in the work of ***Kālidāsa.*** According to the ***vaṁśāvali*** of Nepal, he conquered Nepal and founded the ***Vikrama*** era in 3044 ***kali*** (57 BCE). Vedavyas[62] quotes the date of the beginning of the ***Vikram*** era as ***Citra Pūrṇima,*** on February 23, 57 BCE. However, Figure 22 shows the star map for this date and it is not full moon day. The full moon occurred on 27th February, but at ***hasta.*** This is in reality an ***adhika māsa.*** The ***citra pūrṇima*** occurred on 28th March, 57 BCE. Figure 23 shows the star map for March 14, 57 BCE. It is ***śukla pratipad, aśvini nakṣatra*** and would be the beginning for ***amanta reckoning and February 28, 57 BCE would be the beginning for pūrṇimānta reckoning. The MālavaGaṇa śaka*** of Western India tradition would begin on September 21, 57 BCE on ***kṛṣṇa pratipad, aśvini nakṣatra.***

---

[61] Kota Venkatachelam (1954)

[62] Vedavyas, ibid, p. 238

Professor Sengupta has conclusively established[63] that the so called Gupta era (which is identical to the Vallabhi era) cannot be identified with ***Vikrama Saka,*** based on the analysis of several 'Gupta Inscriptions'. The former started in 319 CE, where as the starting date for the ***Vikrama samvat*** is 57 BCE and has been well chronicled in the dynasty lists from Nepal.

One hundred and thirty years after ***Vikramāditya***, another ***śaka*** was started in 78 CE by ***Śālivāhana,*** who is really a descendant of ***Vikramāditya***. Here is an account of ***Śālivāhana:*** "After the death of ***Vikramāditya,*** when a century had passed, the tribes of ***śakas*** etc. having known about the decline of Dharma in the country, descended with their hordes. Some have come and invaded through the Himalayan passes, others by fording the Sindhu river, still others by sea. They plundered the Aryaland, looted the treasures and captured women….When things came to this state, was born king ***Śālivāhana.*** He defeated the ***^akas*** and Chinese hordes; he

[63] Sengupta (1947) p. 248

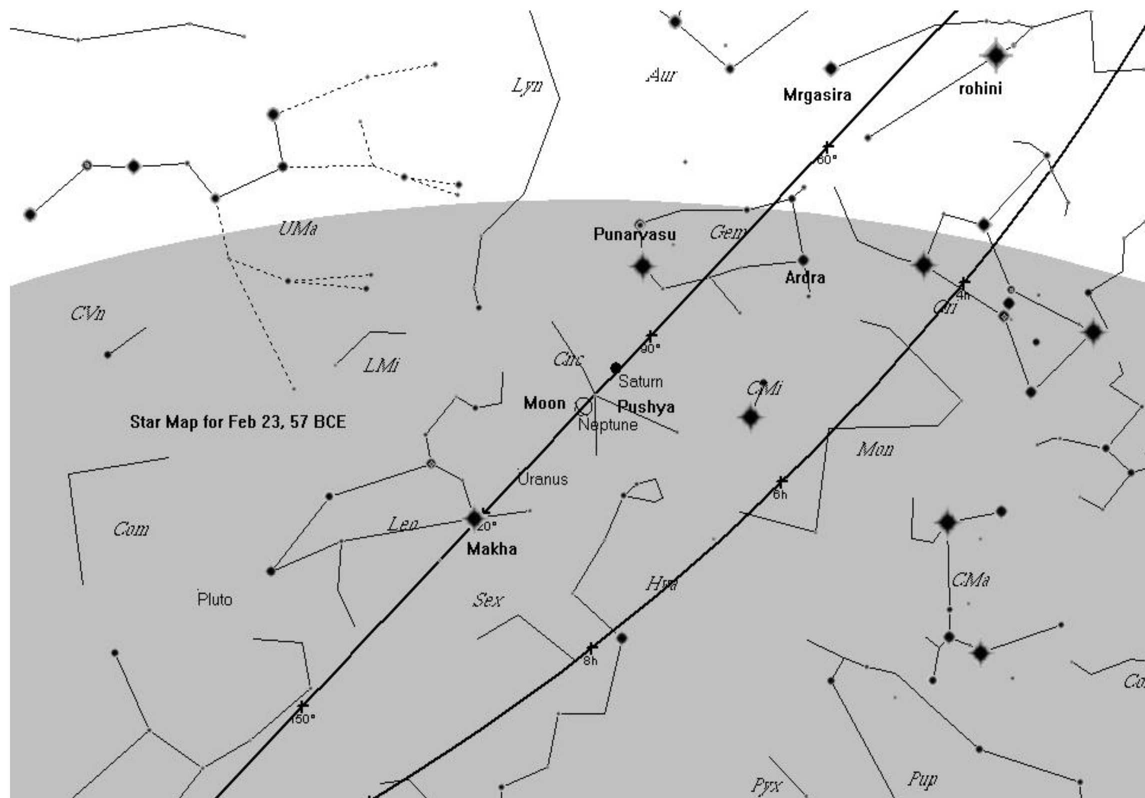


Figure 22 Star Map for February 23, 57 BCE

fixed the boundaries of the Aryaland..” The ***Śālivāhana śaka*** was started in his honor in 78 CE. He cannot be called a ***śaka*** king, so this era has nothing to do with the ***śaka kāla*** or ***śaka-nṛpati kāla,*** which refers to the era of the ***śaka*** king, Cyrus of 550 BCE. ***Śālivāhana śaka*** has been in use continuously for almost two thousand years and also has nothing to do with King Kanishka, who was a ***turuṣka*** king of Kashmir, and ruled after 150 years after ***Buddha’s nirvāṇa*** according to ***Rājataraṅgiṇi.***

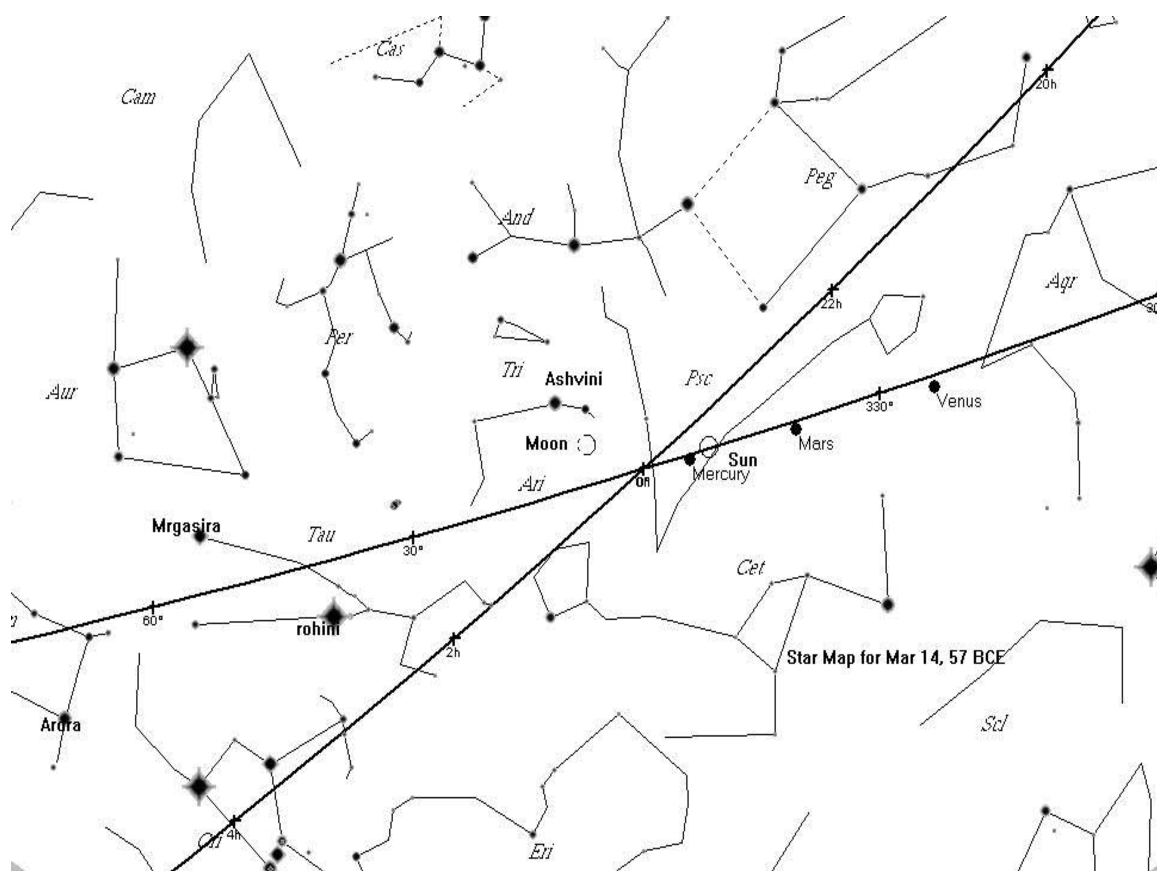


Figure 23 Star Map on March 14, 57 BCE

As already noted, according to the ***Saptarṣi*** tradition, the seven sages are thought to move through the twenty-seven ***nakṣatras*** along the Ecliptic at the rate of one ***nakṣatra*** for 100 years and to complete one cycle in 2700 years. This forms a convenient cycle for reference and is often chronicled by dropping the century years and giving only the last two digits.

The ***Kali yuga, Vikrama śaka, Śālivāhana śaka*** and the ***Saptarṣi*** traditional reckoning have all been used in a very large number of stone and copper plate inscriptions, manuscript colophons and other writings. Kielhorn[64] has listed a large number of those that were available to him in 1891 CE , including 10 dates based on the ***Saptarṣi tradition,*** 288 dates based on the ***Vikrama śaka,*** and 370 dates based on the ***Śālivāhana śaka.*** He gives the following rules for conversion: disregarding the hundreds, one must add to the ***Saptarṣi*** year of a date 25 to find the corresponding year within one of the centuries of the ***Kaliyuga,*** 81 to find the corresponding ***Vikrama śaka,*** and 46 to find the corresponding year in ***Śālivāhana śaka.***

Of the chronological list of 288 inscriptions and literary works using ***Vikrama śaka*** given by Kielhorn[65], the earliest is the Bijayagadh stone pillar inscription of Vishnuvardhana of 428 ***V.ś.***and the latest, 1877 ***V.ś.*** and of the nearly 400 ***Śālivāhana śaka*** dates, the earliest is ***169 Ś.ś*** , a copper plate of the Western ***Gaṅga*** king ***Harivarman,*** and the latest, ***1556 Ś.ś.*** refers to a copper plate of ***Tirumala Nāyaka*** of Madurai. Out of the 288 ***Vikrama*** listings, ten also quote the corresponding ***Śālivāhana śaka*** year and one quotes ***saptarṣi*** year corresponding to it also. A couple of them include the corresponding Hijira and Valabhi years. Figures 24 and 25 show the simulations for the earliest dates ***428V.ś. and 169 Ś.ś.*** respectively and Figure 26 shows the simulation for the date of the Chamba stone inscription, which mentions all the three traditions.

---

[64] Kielhorn (1969) Kleine Schriften, Franz Steiner Verlag, GmbH, Wiesbaden

[65] Kielhorn (1891), "Examination of questions connected with the Vikrama Era", The Indian Antiquary, vol. XX, pp. 124-142.

The inscription of ***428 V.ś.***on the Bijayagadh pillar reads:

Kṛteṣu caturṣu varṣa śateṣvaṣṭāviṁśeṣu 400 20 8 phālguṇa bahulasya

pañcadaśśyāṁ etasyāṁ pūrvāyāṁ……

The date of ***phālguṇa bahula amāvāsya*** corresponds to January 22, 372 CE and Figure

24 shows the star map at sunrise on this date. The copper plate inscription of 169 ***Ś.ś.*** reads: ***śakakāle navottaraṣaṣṭireka śata gateṣuprabhava saṁvatsarābhyantare….. phālguṇamāvāsya bhṛguvāre revati nakṣatre……***

Again the date is ***phālguṇa amāvāsya*** and corresponds to March 13, 248 CE. Figure 25 shows the star map at sunrise for this date. It may be noted that this copper plate had been characterized as a 'spurious inscription' by Fleet. These two simulations validate the ***Vikrama*** and ***Śālivāhana*** traditions.

The Chamba Stone inscription[66] bears the following date: ***"śrimannṛpati Vikramāditya saṁvatsare 1717 śrīŚālivāhana śake 1582, śrīśāstra saṁvatsare 36, vaiśākhavādi trayodaśyāṁ budhavāsare meṣārkasaṅkrāntau….".*** The reference to the ***saptarṣi*** year is described as the reference to ***śāstra*** year, which is equivalent to a ***Vikrama*** Year (36+81=117)=17, omitting the hundreds in counting, and to a ***Śālivāhana*** Year (36+46=82)=82,again omitting the hundreds in the counting. The date corresponds to April 7, 1660 CE and figure 26 shows the star map at sunrise for this date. This agrees with Kielhorn's date of March 28, 1660 as per the Julian Calendar. A check with the software Panchang3[67] shows that this date corresponds to Wednesday, and that the ***meṣasaṅkrānti*** occurred that day. This simulation validates all the

---

[66] Archaeological Survey of India, vol. XXI, p. 136

[67] Yano

three eras ***saptarṣi,Vikrama and Śālivāhana*** at the same time.

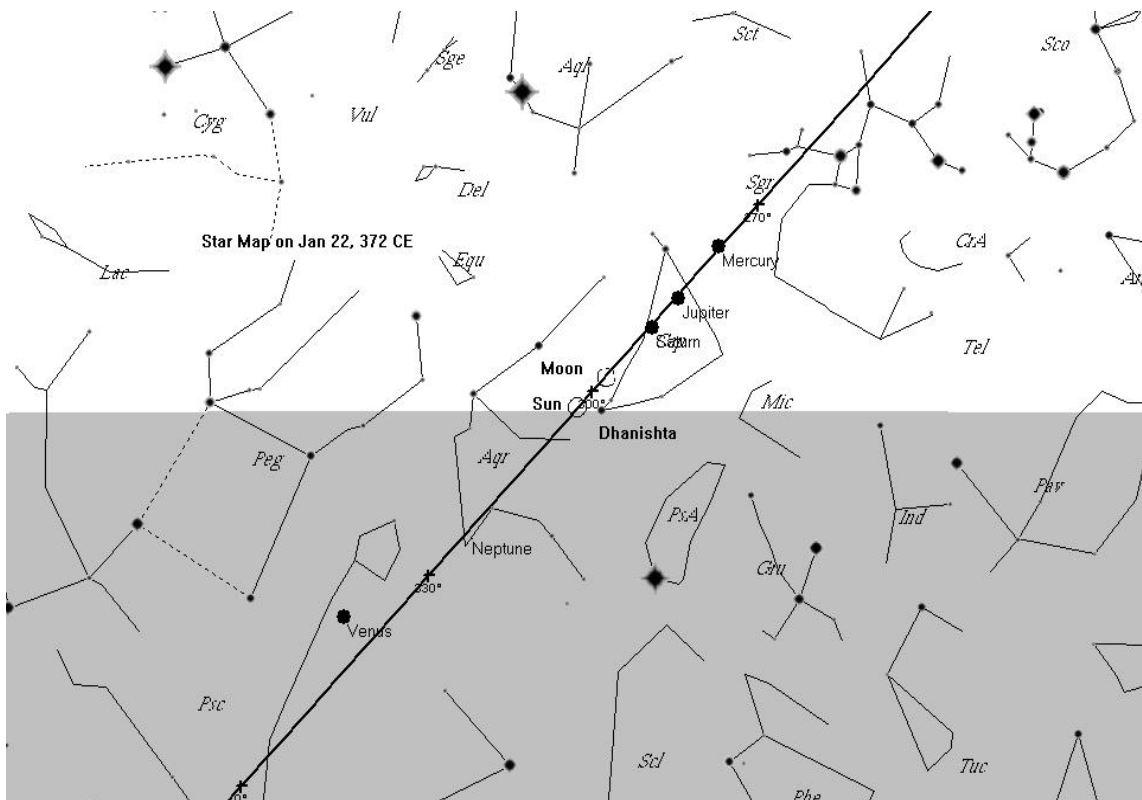


Figure 24 Star map on January 22, 372 CE

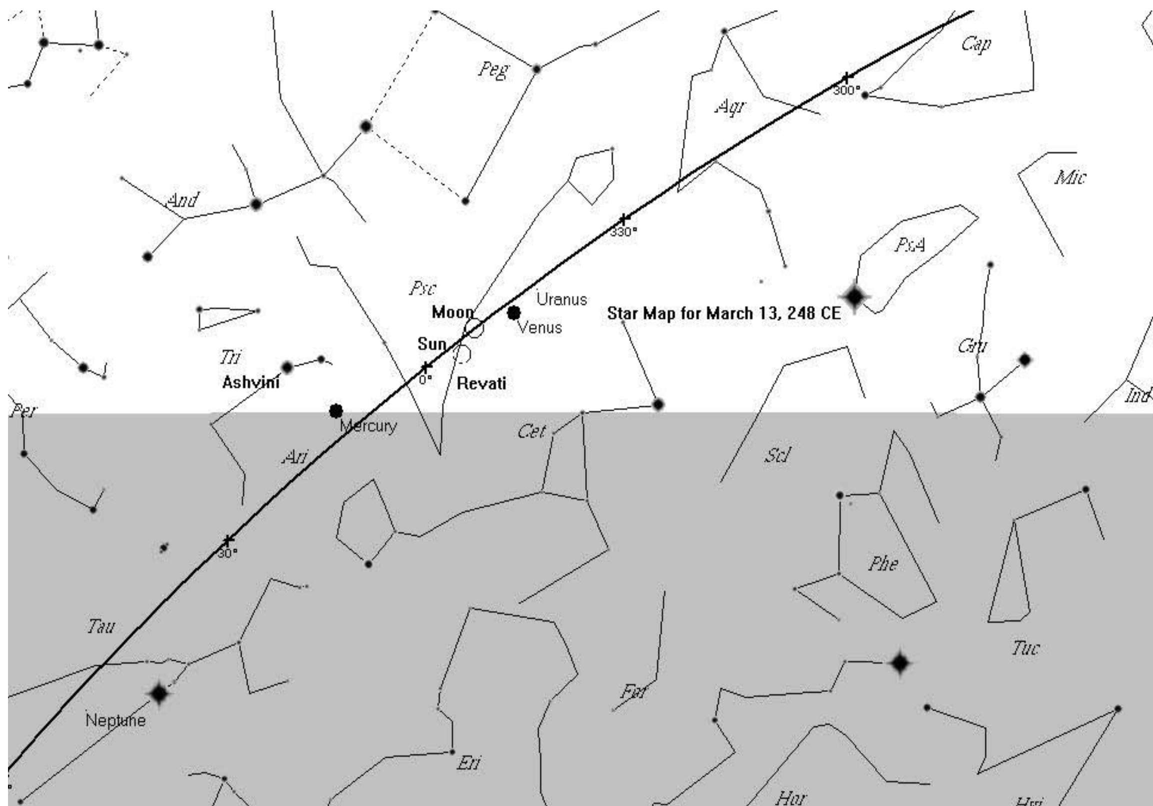


Figure 25 Star Map for March 13, 248 CE

59

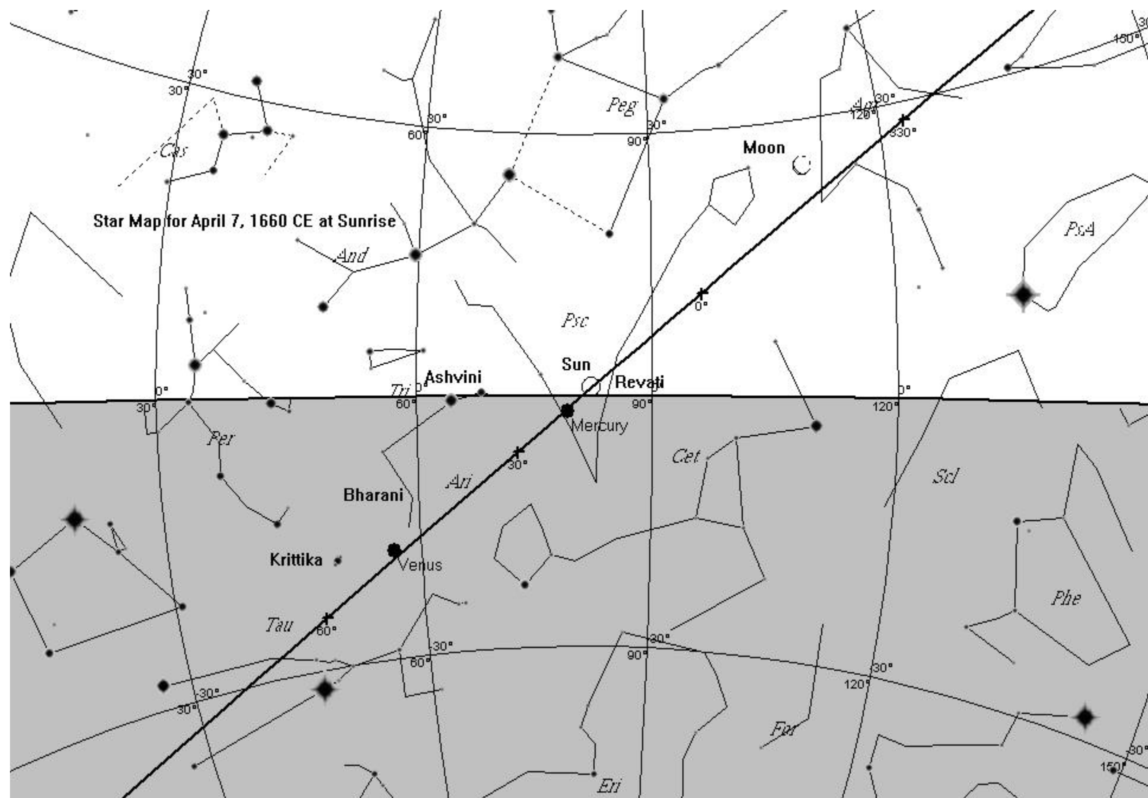


Figure 26 Star map for April 7, 1660 CE at sunrise

Kielhorn also lists five inscriptions, which give dates of solar eclipses and five inscriptions, which give dates of lunar eclipses, all in ***Vikrama śaka.*** According to Kielhorn, all the lunar eclipse dates can be verified, but only two of the solar eclipse dates. Our simulations confirm the dates regarding the lunar eclipses. For solar eclipse dates, the simulations confirm the occurrence on four occasions, and the fifth date may in fact be a misreading. Figures 27 and 28 show examples of the occurrence of the solar and lunar eclipses respectively. These simulations attest to the veracity of all the three eras ***saptarṣi,Vikrama and Śālivāhana*** traditionally used in ***Bharata*** chronology.

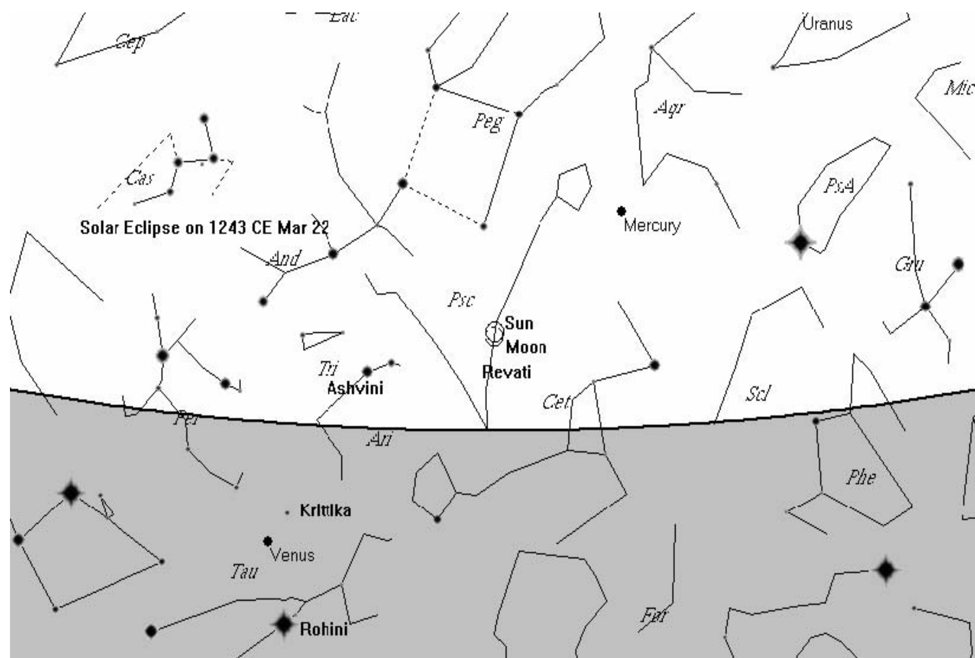


Figure 27 Solar eclipse on March 22, 1243 CE

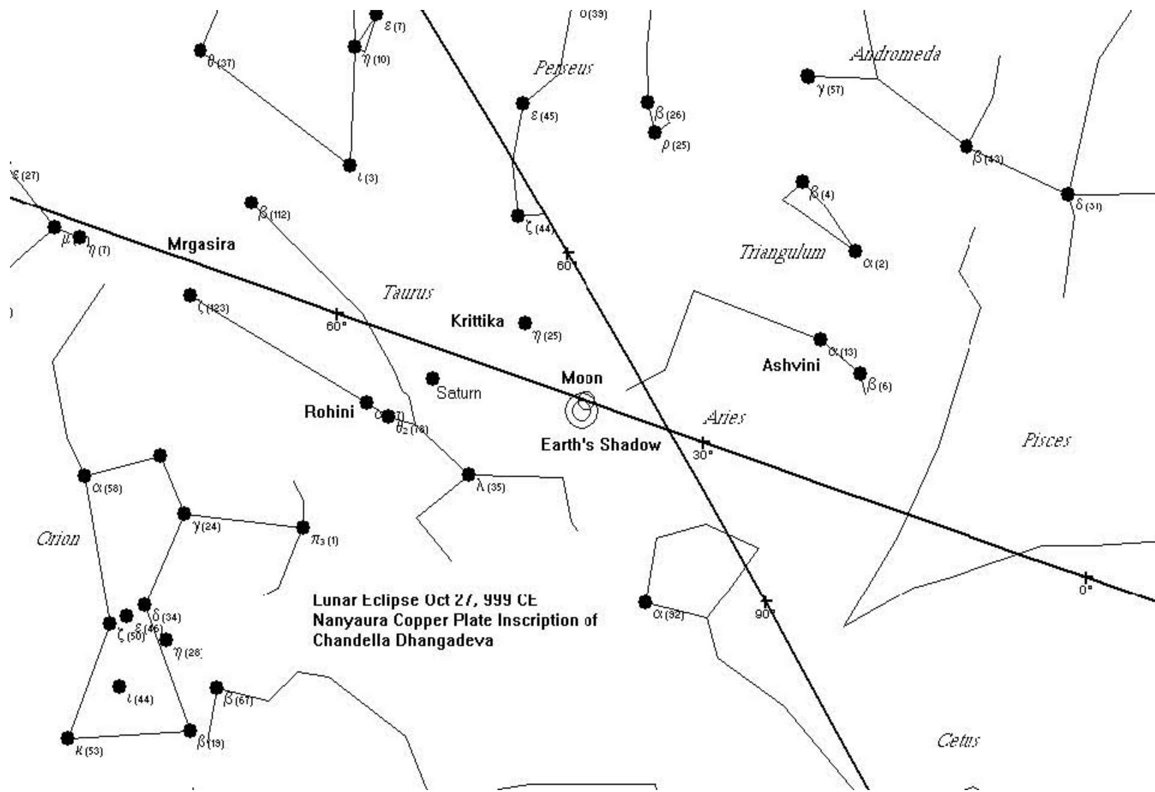


Figure 28 Lunar Eclipse on October 27, 999 CE

XIV. Kanishka's Date

The Western historians have tried to identify Kanishka era with 78 CE in their attempt to deny historicity of the ***Śālivāhana śaka. Professor*** Sengupta[68] had considered astronomical information from two ***kharoṣṭhi*** inscriptions which refer to regnal years of Kanishka , but could not match with the 78 CE date and so he proposed his own date for the starting of the Kanishka era. The inscriptions[69] in question are no.26 and no. 35 in the Corpus Inscriptionum Indicarum

[68] Sengupta (1947)

[69] 26 Zeda. ***saṁ 11 Āṣāḍhasa masasa di 20 utaraphalgune is'a kṣuṇāmi marodasa marjhakasa kaṇIṣkasa rajemi.***
35 Und. ***Saṁ 61 cetrasa mahasa divasa athami di 8 ise kṣuṇāmi pirvāṣāḍhe***

Vol. II. edited by Sten Konow. According to the inscriptions, in the eleventh year of reign of king Kanishka, on the 20th day of ***Āṣāḍha,*** it was ***uttaraphālguṇi nakṣatra.*** In the year 61, on the 8th day of ***caitra***, the ***nakṣatra*** was ***pūrvāṣāḍha.*** Konow had concluded that the full moon day was the first day of the month in these inscriptions. Sengupta correctly pointed out that there is no such Indian system in which the first day of the month is the full moon day. The months are full moon ending months and the 20th day of ***Āṣāḍha*** of the inscription would correspond to ***śrāvaṇa śukla pñcami*** and 8th day of ***caitra*** would correspond to ***caitra kṛṣṇa aṣṭami.*** With these calendrical data, when Sengupta tried to calculate the dates based on the 78 CE as the beginning of Kanishka era, he could not quite match the data from the inscriptions. So he proposed that the Kanishka era be started from December 25 of 79 CE, nearly two years after the ***Śālivāhana śaka.***

But, based on the list from ***Rājataraṅgiṇi,*** Kanishka's date would be 1298 BCE. The eleventh and sixty-first years would be 1287 BCE and 1237 BCE respectively. Figure 29 shows the star map for June 23, 1287 BCE, it is ***śrāvaṇa śukla pañcami uttaraphālguni,*** an exact match to the inscription. Figure 30 shows the star map for March 1, 1237 BCE, ***caitra kṛṣṇa aṣṭami,*** also an exact match to inscription no. 35. This clearly establishes the consistency of the record in ***rājataraṅgiṇi*** with the ***kharoṣṭhi*** inscriptions and hence the misidentification of Kanishka era by the Western historians.

Figure 29 Star map for June 23, 1287 BCE, it is ***śrāvaṇa śukla pañcami uttaraphālguni,***

Figure 30 Star Map on March 1, 12347 BCE

XV. Conclusions.

The real history of ***Bhārata*** is preserved in its ***itihāsa*** and ***purāṇa*** texts. The

Chronology is comprehensive and cogent. Simulations of the astronomical data preserved in these texts, using modern planetarium software, have attested the coherence of the chronology. From the date of the ***Mahābhārata*** war, the ***sarpa yāga of Janamejaya,*** the date of ***Buddha, Aśoka Maurya, Kanishka, Ādi Śaṅkara, the Gupta period, through the Vikrama*** and ***Śālivāhana śakas***, the chronology exhibits a continuous flow which has been convincingly demonstrated by the simulations using planetarium software. The consistency is staggering. Many of the sticky points with 'traditional chronology' of the historians is simply resolved with these stimulations. There is still a large body of inscriptional data awaiting validation by simulations using the planetarium software. A lot of work needs to be done for checking the consistency with numismatic data.

List of Abbreviations

AP ***Atharvaveda Pariśiṣṭha***

MB Mahabharata Critical Edition

SN ***Saṁyutta Nikāya***

List of illustrations

Figure 25. Star Map for March 13, 248 CE

Figure 26. Star map for April 7, 1660 CE, ***vaiśākha vādi trayodaśi, meṣa saṅkrānti***

Figure 27. Solar eclipse on Mar 22, 1243 CE

Figure 28: Lunar eclipse on Oct 27, 999 CE.

Figure 29. Star map for June 23, 1287 BCE, ***śrāvaṇa śukla pañcami, uttara phālguni***

Figure 30. Star map for Mach 1, 1237 BCE***, caitra kṛṣṇa aṣṭami, pūrvāṣādha***

Bibliography

Basham, A.l., (1953), *The Wonder that was India,* Grove Press Inc., New York

M. Ramakrishna Bhat, ***Varāhamihira's Bṛhatsaṁhitā***, Part I. Edited with English translation. (Delhi : Motilal Banarsidass, 1981).

Gupta S. P. and Ramachandran, K. S.,(1976), (editors) *Mahabharata, Myth and Reality-Differing Views*, Agam Prakashan, Delhi;

Kamath, S. U., (Bangalore, 2004), (Editor) The Date of the Mahabharata War Based on Astronomical Data*,* Mythic Society

Kielhorn, F.,(1969), *Kleine Schriften*, Franz Steiner Verlag, GmbH, Wiesbaden.

Majumdar, R. C., Raychaudhuri, H. C., Kalikinkar Datta, (1978) *An Advanced History* of *India,* Macmillan India Pvt. Ltd. , Madras

Ramachandran, V. G.,(1998) ' Date of Adi Sankara' in *Ancient India*, Mahalingam, N., (Ed), International Society for the Investigation of Ancient Civilization, Chennai. Pp.261-304

Raychaudhuri, H. C., (1923), *Political History of Ancient India*, University of Calcutta, Calcutta, p. 10

Sathe, S.,(1983) *Search for thr Year of the Bharata War*, Navabharati Publications, Hyderabad

Sengupta, P. C., (1947*) Ancient Indian Chronology*, University of Calcutta, Calcutta.

Sircar, D. C., (1969), "The Myth of the Great Bharata War", in *The Bharata War and th*e *Puranic Geneologies*, University of Calcutta, pp 11-27

Vaidya, C. V.,(1983) The Mahabharata A criticism, Cosmo Publications, New Delhi, p. 80.

Vedavyas, E., (1986), *Astronomical Dating of the Mahabharata War*, Agam Kala Prakashan, Delhi.

Kota Venkatachelam, (1954) *The Plot in Indian Chronology,* Arya vijnana, Vijayavada



Quote from W Brennand "Hindu Astronomy" Caxton Publications, Delhi, India, first published in March 1896, ISBN 8185066248, page 320-321, Chapter XV

Upon the antiquity of that (Hindu Astronomy) system it may be remarked, that no one can carefully study the information collected by various investigators and translators of Hindu works relating to Astronomy, without coming to the conclusion that . long before the period whe Grecian learning founded the basis of knowledge and civilization in the West, India had its own store of ***erudition.*** *Master minds, in those primitive ages, thought out the problems presented by the ever recurring phenomena of the heavens, and gave birth to the ideas which were afterwards formed into a settled system for the use and benefit of succeeding Astronomers, mathematicicans and Scholiasts, as well as for the guidance of votaries of religion .*

No system, no theory, no formula concerning those phenomena could possibly have spruing suddenly into existence into existence, at the call or upon the dictation of a single genius. Far rather , is it to be supposed that little by little, and after many arduous labors of numerous minds, and many consequent periods passed in the investigation of isolated phenomena, a system could be expected to be formed into a general science concerning them

(12710 words)

Chapter 4 Re-establishing the Date of Lord Buddha

Stephen Knapp PhD

Most of us are taught that Buddha was born around 560 to 550 B.C. However, once we start doing some research, we find evidence that this date may be too late. Buddha may have been born much earlier.

For example, the *Puranas* provide a chronology of the Magadha rulers. During the time of the *Mahabharata* war, Somadhi (Marjari) was the ruler. He started a dynasty (The Brihadratha dynasty) that included 22 kings that spread over 1006 years.They were followed by five rulers of the Pradyota dynasty that lasted over 138 years. Then for the next 360years was the 10 rulers of the Shishunag family. Kshemajit (who ruled from 1892 to 1852 B.C.) was the fourth in the Shishunaga dynasty, and was a contemporary of Lord Buddha's father, Shuddhodana. It was during thisperiod in which Buddha was born. It was during the reign of Bimbisara, the fifth Shishunaga ruler (1852-1814B.C.), when Prince Siddhartha became the enlightened Buddha. Then it was during the reign of KingAjatashatru (1814-1787 B.C.) when Buddha left this world. Thus, he was born in 1887 B.C., renounced theworld in 1858 B.C., and died in 1807 B.C. according to this analysis.

Further evidence that helps corroborate this is provided in *The Age of Buddha, Milinda and King Amtiyoka and Yuga Purana*, by Pandit Kota Venkatachalam. He also describes that it is from the *Puranas*, especially the *Bhagavat Purana* and the *Kaliyurajavruttanta*, that need to be consulted for the description of the Magadha royal dynasties to determine the date of Lord Buddha. Buddha was the 23rd in the Ikshvaku lineage, and was acontemporary of Kshemajita, Bimbisara, and Ajatashatru, as described above. Buddha was 72 years old in1814 B.C. when the coronation of Ajatashatru took place. Thus, the date of Buddha's birth must have beennear 1887 B.C., and his death in 1807 B.C. if he lived for 80 years.

Professor K. Srinivasaraghavan also relates in his book, *Chronology of Ancient Bharat* (Part Four, Chapter Two), that the time of Buddha should be about 1259 years after the *Mahabharata* war, which should make it around 1880 B.C. if the war was in 3138 B.C. Furthermore, astronomical calculations by astronomer SwamiSakhyananda indicates that the time of the Buddha was in the Kruttika period, between 2621-1661 B.C.

Therefore, the fact that Buddha lived much earlier than what modern history teaches us has a number oframifications. First, the time of the Buddha's existence is underestimated by about 1300 years. Secondly, thismeans that Buddhism was in existence in the second millennium B.C. Thirdly, we also know Buddha preachedagainst the misused Vedic rituals of animal sacrifice. Such misuse or misinterpretation of something in aculture generally only happens after a long period of prominence. So the purer aspect of Vedic culture musthave been around for many hundreds if not thousands of years before its tradition began to be misused.Therefore, this pushes the Vedic period to a much earlier time from that of Buddha than originally figured, andmuch earlier than

many people have calculated. And lastly, everything else we have figured according to thetime frame of the appearance of Buddha now has to be re-calculated. Again we find that history has to beadjusted away from the speculations of modern researchers, and that many of the advancements in societyand philosophy, as outlined in the Vedic texts, had taken place much earlier than many people want to admit.

(More information is found at: http://www.stephen-knapp.com)



(574 words)

Chapter 5 History of Ancient India: Distorted and Mutilated

Jagat Motwani PhD

The national history taught in schools has tended to encourage the most general and terrifying of existing evils, "human presumptions and particularly intellectual arrogance," or in other words self righteousness. Wrong history is being taught in all countries, all the time, unavoidably; while we have great need of history, our first need is to unlearn most of what we have been taught.

Historian Herbert Butterfield[70]

HERBERT J. MÜLLER (1958: 28) writes that on a national scale, history becomes the kind of prejudice and conceit that led Paul Valery to call history the most dangerous product ever concocted by the chemistry of the brain. Müller says that Valery wrote:

It (History) causes dreams, it makes nations drunk, it saddles them with false memories, it exaggerates their reflexes, it keeps their old sores running, it torments them when they are at rest, and it induces in them megalomania and the mania of persecution. It makes them bitter, arrogant, unbearable, and full of vanity.

One will finding history all of this – prejudice, conceit, false memories, exaggerations, absurdities, arrogance, vanity – when one reads what European historians have said about the age and authorship of the Vedas, Sanskrit, Swastika, Dravidians and their languages, origin of the Aryans, Hindu gods, etc. It becomes apparent that these historians have been successful in crafting confusion by distorting the dates of significant events related to the ancient history of Bharat, the West envied. It seems, European scholars have knowingly ignored what is written in Vedic scriptures, saying that they are mythological and not historically worth believing. They claim they know better than India's native scholars and scriptures know. The East India Company brought in missionaries and introduced them as Sanskrit scholars to translate Vedic scriptures who with the help of bribed poor Pundits to translate our scriptures to fit in their hidden ethno-political agenda.

---

[70] Taken from Herbert J. Muller, "*The Loom of History*" New York: Harper & Brothers, 1958, p. 28.

This has happened not only with India, but with several countries, colonized by the West, particularly by Britain. Histories have been written by victors. Their pen had the colonial power to write what they wanted to, with the purpose to infuse in the Indian psyche ethnic inferiority complex. They succeeded. Impressions, implanted by first histories, become too deep to get erased. Post-independence sixty years are not enough for a nation, particularly for India has been under bondage for over a millennium to wake up from colonial soothing anesthesia.

Thus history, particularly of ancient India, has been obscured and confused. This has been more adversely affected because of the attitude of indifference towards history on the part of ancient Hindu historians[71]. Lieut. Col. F. Wilford, in the Asiatic Society of Bengal's research series, led by William Jones (1746-94), section: "*On the Ancient Geography of India"* (Vol. XIV, pp.374-376), says that some Puranas have information about the names of some mansions, geographical tracts, mountains, rivers, etc., but without any explanations about them. Wilford also describes his difficulties and frustrations in collecting relevant data, mainly because of lack of adequate cooperation from Pundits and Hindu historians.

If Wilford had received full cooperation and if historians, over the years, referred to the ancient names of the rivers and towns in addition to their respective modern names, we would have been able to get clearer picture of ancient India's geographical spread. The history of ancient India, therefore, has been erroneous and infected with several gaps.

Unfortunately, still there are many who believe that it is because of Britain India has a long network of railways, universities, drainage system, etc. They think India would have not uplifted herself if Britain were not there. They, being great angrez-raj-bhagta, refuse to realize what India – who has technologically achieved so much during sixty years of her independence – would have achieved if she had independence of more than a millennium. Bharat would have soared through the roof to touch the sky. We should know that the Britain did not allow India have industries except textile. Raw material was exported to Britain for importing back the products manufactured thereof.

In order to know what India would have been if she had independence long back, they should read books on the five thousand year old Indus Valley civilization to know that its two main cities, Mooanjodaro in Sindh and Harrapa in the Punjab, had parallel broad avenues, great drainage system, public swimming pool, brick houses with a well inside, etc. The people were literate and had know how about architecture and city planning. They knew technology of ship building and navigation because of which they had maritime links with Egypt, Mesopotamia (present Iraq), Asia Minor, Bahrain, etc. Bharat had Nalanda Vishwa Vidalaya in her ancient times. Sanskrit dictionary had "Vishwa Vidalaya" word for university.

Return of Aryans to India, misinterpreted as invasion of India

---

[71] Ed. Note – The reason for this is that even when there were copious records of dynasties, the Occidental either failed to make use of them or what was just as likely was unaware of their availability or was unable to comprehend them because of inadequate knowledge of Sanskrit. We must remember that the number of Sanskrit scholars in the entire Occidental world did not perhaps exceed 20 to 30 individuals at any given time Only in the recent past has that number increased to some degree. Kalhana's Rajatarangini is a case in point where very few had read his work which is quite exhaustive. The criticism is perhaps more valid during the medieval era, but by that time the Indic had lost control of the destiny of his own land and there were far fewer Royal families who had an interest in ancient India and could afford a Historian.

It would be interesting to analytically examine what Garraty & Gay have said about the migratory journey of Aryans from Greece into India via Iran:

"The Aryans ("noble ones") were part of a large Indo-European migration which left a common cultural heritage from Greece through Iran into India. The religious and social institutions of these invaders are reflected in the oldest stratum of the Veda) – the most revered sector of traditional Hindu religious literature. The tribes were led by an aggressive warrior aristocracy mounted on horse-driven chariots, and armed with copper and bronze weapons of good quality."

The relationship of their religious and social institutions with the Vedas and the Hindu religious literature clearly suggests that these travelers or invaders from Greece were originally Indo-Aryans. It is clear evidence of Indo-Aryan kingdoms in Greece or in its neighborhood. Those Indo-Aryans must be returning to India, the country of their ancestors which has been misinterpreted as Aryan invasion of India.

Temple of History has been maligned

E. Pococke, in his "*India In Greece" or "Truth in Mythology"* (preface, p. vii), seems to be helplessly rebuking the European scholarship for destroying the temple of history:

"A gigantic mass of absurdities now lies exposed, for a sifting examination. It remains for the patient sagacity of European scholarship, working upon both Occidental and Oriental materials, to re-build, I trust, upon no unstable foundation, that Temple of History which national vanity has destroyed, and whose ruins national Bud'hism has obscured."

Pococke further writes (p. ix): "Our ignorance it is which has made a myth of history; and our ignorance is an Hellenic inheritance, much of it the result of Hellenic vanity." Why Pococke, it seems, has titled this book also as, " *Truth in Mythology".* European scholarship ignorance or rejection of the oriental history is the product of their belief – unconscious or deliberate – that oriental mythologies as contained in their respective traditional scriptures are sentimental and do not give history. Ironically, it reflects their double standards. They themselves consider their own Biblical mythologies as reliable history.

Should one be called a scholar who is shy of admitting his errors?

In light of recent research, including excavations, pointing to the previous inaccuracies, the example of Donald Foster comes to my mind. Foster admitted that his work to establish Shakespeare as the author of an obscure poem was incorrect. Foster candidly admitted his mistake, and gave a very important message of professional ethics to scholars, particularly historians: "No one who cannot rejoice in the discovery of his own mistakes deserves to be called a scholar."[72]

History and Identity:

Wrong and misinterpreted history has confused Hindus about their identity and about the antiquity of their heritage. They have questions about the origin of Aryans and about Aryan invasion. If you want to weaken a nation, distort its history. If you want to destroy a community, confuse its ethno-cultural identity and heritage. Western colonials have done this to the ancient Hindu nation in general, and to the history of Sind, in particular. Sind is the region of the Indus (Sindhu) Valley civilization, which is the core civilization of Hind (Hindustan), the

---

[72] Quotation of the Day, NY Times, June 20, 2002.

Hindu Samaj. The word "*Hind"* has been derived from the word "*Sind"*, "*Hindi"* from "*Sindhi"*, and "*Hindu"* from "*Sindhu"*. History of Sind reflects lot about history of India. Henry Cousens, in his "*The Antiquities of Sind"* (1929, p. 13), describes the history of Sind as full of contradictions and confusion:

"Materials for the history of Sind, previous to the time of the Arab conquest in A.D. 711, are meager indeed, and what exist are contained almost solely in the accounts of a few Arab writers. The most lucid account, though very short, of the country immediately preceding the establishment of Arab rule in the province, is to be found in the *Chach Namah* which is a Persian translation of a work written by Ali, son of Muhammad Kufi, in A.D. 1216. Two later works on the history of Sind – the *Tarrikh-i-Masumi* or *Tarikh-i-Sindh* and *Tuhfatu-l-Kiram* – were to a great extent based upon the *Chach Namah* in their accounts of the earlier periods.[73] The history of Sind, as told by its own historians, with contradictions and various spellings of names, is very confusing; but this is as nothing to the hopeless tangle caused by the contradictory translations and commentaries of modern writers, each of whom is perfectly convinced in his own mind that he alone is right. … Nor do Hiuen Tsiang's brief and perplexing references help us much more. A long dark period of a thousand years in which we catch glimmers of the White Huns and other invaders, is as yet untraversed by any but the faintest rays of light."

Cousens writes that *Chach Namah,* also known as the *Tarikh-i-Hind wa Sind,* was originally written in Arabic. He further writes that the history of Sind, as written by its own historians, is full of contradictions and confusion.

As a matter of fact, the history of Sind, as suggested by Cousens, was not written by Sind's natives, Sindhi Hindus. Rather, it was written by Arabs in Arabic followed by faulty translations. This history – *Tarikh-i-Hind wa Sind* – does not illustrate what had happened to, or in Sind before the Arab invasions. The pre-711 AD history of Sind would have helped Sindhis to know their 5000 year long heritage. The Mooanjodaro seals would have told more, if they were fully deciphered. How will the future Sindhi Hindu generations will know that their grand parents were born and raised in Sind when they read the book entitled as "*Five Thousand Years of Pakistan",* published in 1950, when Pakistan was not even three year old? The name "Indus" for "Sindhu Nadi" may not convince many youngsters that it ran through Sind. The same way, how would the name "India" for "Aryavarta" or "Bharat" convince us that none, but Bharat (Aryavarta) is the original home of the Aryans and their language Sanskrit?

Herbert J. Müller[74] tells that Herbert Butterfield, himself a historian, feels that the national history taught in schools has encouraged the most general and terrifying of existing evils, human presumptions and intellectual arrogance. He concludes:

"While we have great need of history, our first need is to *unlearn* most of what has been taught. A superficial, confused and distorted notion of history is far more dangerous than ignorance of it."

---

[73] In this account, I have chiefly followed the translation by Mirza Kalichbeg Fredunbeg of Sind Civil Service. The *Chach Namah,* also as the *Tarikh-i-Hind wa Sindh,* was originally written in Arabic.

[74] Herbert J. Muller, op. cit. p.28.

We have blindly endorsed most of the ethno-socio-cultural theories, particularly – "*Aryan Invasion of India"*, "*Aryans and Dravidians",* and "*Indo-European Family of Languages"* – which have been expounded by Western scholars with their missionary agenda to confuse our heritage. Our own politicians have remained apathetic, silent, indifferent, and unconcerned. It seems, they have been resisting getting history of ancient India corrected, apparently because of political reasons, fear of losing minority votes.

The historian Graham Hancock, in '*Underworld: The Mysterious Origins of Civilization'* (2002, p.116), remarks: "Almost every thing that was ever written about this (Indus) civilization before five years ago is wrong." Mr. Hancock concludes that during most of the twentieth century, the archaeological record refused to reveal evidence of the Indus civilization's long period of development. This created a vacuum, a dark hole in history, European scholars took advantage of. Hancock remarks: "European scholars felt free to conclude that the Indus Valley civilization might, in its origin, have been alien to India." We know that the socio-cultural and religious landscape, before the advent of Muslims in the region, was very much similar, if not identical, to that in the rest of Bharat.

Hancock (2002:169) explains how the culture of the ancient India has been scholarly misinterpreted:

"The Indus-Sarasvati civilization was a literate culture, but the archaeological interpretation of it has been strictly limited to excavated material remains and has never been able to draw upon the civilization's own texts. This is because all attempts to decipher the enigmatic 'Harappan' script have failed, and because (at least until very recently) the Sanskrit Vedas were regarded as the work of another, later culture and were assumed to have had nothing to do with the Indus-Sarasvati civilization. Well into the twentieth century, this approach simply meant that there was no Indus-Sarasvati civilization. It was not part of the archaeological picture of India's past and was never even contemplated. It was, in other words, as 'lost' as Plato's Atlantis until the material evidence that proved its existence began to surface when excavations were started at Harappa and Mohenjo-daro in 1920s."

Even now, for some or even larger section of the world society – the Eastern (particularly Indian) as well as the Western – the Sindhu (Indus) Valley civilization has remained lost as Plato's Atlantis, because of the reasons:

The first-written-history has strong impact, because it gets implanted in the reader's mind too deep and too hard to disbelieve it. Old is considered wisdom and truth. Wrong history has gone down to so many generations.

even twist things around to reinterpret them as facts.

Some Indian scholars have attempted to modify the history by reinterpreting the events in light of new historic developments. The general tendency is to discard them as sentimental and communal. Unfortunately, nationalism is being politically branded as communalism and fundamentalism. Such sort of contra-nationalistic thinking is being considered as a progressive fad, and nationalistic persons are criticized as conservative and backward. Previously, colonial ethnic politics was out to distort the ancient history of India, now our own domestic politics has been a strong obstacle against correction of the historic distortions.

The illiteracy among the massive rural segment of the society has prevented many from reading such a wrong and ethnically injurious history.

Arya is a Sanskrit word. It appears numerous times in the Rig Veda, which was composed at least two thousand years prior to the Indus civilization. The Indus civilization was established more than a millennium before 1500 B.C., the time the Aryans allegedly invaded India. How, then, can one talk about the 'Aryan invasion of India'?

.

Sind after Arabs conquered it in 711 A.D.?

Henry Cousens (p. 1) writes:

“Sind is a land of sepulchers and dust, of “holy” shams and “holy” humbugs. When the good old times under Hindu rule gave way to Muhammadan domination, the principal concern of its rulers seems to have been for the selfish pleasures of the living and the glorification of their dead. It has been a country very fruitful in the production of *pirs* or holy men; and, though some of these have, no doubt, been earnest disciples of the Prophet, many more have made it a cover for base and selfish motives.”

The cultural face of Sindh was systematically transformed from ‘Hindu’ to ‘Muslim’. The names of most of the towns, cities, lakes, rivers, canals, and various public places were changed to erase its *Vedic* (Hindu) identity. The same was done to the history of the countries with their names suffixing in ‘istan’ to the extent that their original historical identity has been buried too deep for even historians to know. Post-1947 Sindh continues to suffer from this quiet cultural agenda. *Ram Baugh* in Karachi is renamed as ‘*Aaraam Baugh’,* and a book titled: “*Five Thousand Years of Pakistan: An Archaeological Outline”* was published in 1950, when Pakistan was only three years old. In its Preface, Fazlur Rahman, the then Minister of Commerce and Education in Pakistan remarks:

“This book has been compiled for the purpose of presenting both to Pakistan and to the outside world a brief sketch of the imposing material heritage of Pakistan in the form of ancient buildings, sites and cultures prior to the death of the emperor Aurangzeb in A.D. 1707. In quantity, in range and in quality, this heritage is one of which the new Dominion may be justly proud.”

Mr. Rahman, consciously or unconsciously, seems to have avoided the use of word – Hindu or Vedic – although there is a reference to Buddhist art. Most of the book is crowded with descriptions of tiled mosques, Moghul fortresses and tombs. Rightly, he seems to call it as “material heritage of Pakistan”, not cultural nor spiritual. Mr. Rahman states Pakistan’s history-related agenda:

“The story of these things is worth the telling and re-telling, in every school and university of the land. The heritage of Pakistan must be kept alive if the future is to grow strongly and healthily out of it. It will be no good to tie new leaves on to a dead tree.”

In other words, Rahman does not want Pakistan be connected with ancient culture whom he seems to brand as “a dead tree”. Then, how does he brag about the five thousand year old heritage of Pakistan? The book tells how history can be distorted and mutilated.

Technically, it is right that the heritage of the natives (mainstream Muslims) of Pakistan is five thousand years long and even longer. But for Rahman, the pre-711 A.D. religio-cultural tree of Sind should be considered “dead”.

Cousens (p.1) has cited Elliot’s[75] description of the squandering of public funds by Talpurs:

“It notoriously swarms with sanctified beggars and imposters, and contains, according to the current saying, no less than 100,000 tombs of saints and martyrs, besides ecclesiastical establishments, which, under the Talpurs,

[75] Elliot’s Appendix to the Arabs in Sind, p.63.

absorbed one-third of the entire revenue of the state."

I recall that in my boyhood days in Sindh, a person, who squandered his money, was taunted as a Talpur. But, I think Talpurs knew that swarm of tombs would give Sind new reIigio-cultural face to Sind.

Traditional name of a country reflects its identity

Ceylon, immediately after getting independence, regained its ancient name 'Sri Lanka'. Sri Lankans feel sentimentally associated and emotionally connected with it. The foreign-given name 'Ceylon' would not accurately convey to Sri Lankans their cultural history. India has not yet regained its traditional name and it seems is not going to. Its constitutional name "Bharat" is no more than a paper name. It has not been known to the international community at the United Nations, excepting a few neighboring countries, such as Pakistan, Bangladesh, Nepal, etc. None of India's post-independence governments has shown effective interest to give India its original name.

The name, especially of a nation, speaks immeasurably of its history and culture. The name of a nation is a stepping-stone to define the identity of its original people and the antiquity of their society. India – because of its politics and the traditional indifference of its people to its history and national identity[76] – has been sleeping over the issue. Its metropolis cities – Bombay, Madras and Calcutta – have regained their respective traditional names – Mumbai, Chennai, and Kolkata.

Original names reflect history

Distortion or mutilation of history is done by burring them too deep to see the sunshine. Victors, invaders, colonialists, or occupiers, in general, do not want the world, particularly the people of present India, know about the glories of the ancient India. They change the name of the country or region they occupy, and also the names of its towns, rivers, mountains, streets, gardens, etc. to insure that the future generations would not know who were its original masters. This has happened to so many countries in the Middle East comprising of Asia Minor, Iran, Egypt, Mesopotamia, Bahrain, etc.; and also several countries in Central Asia including Balochistan, Afghanistan, Tadzhistan (Tajikistan), Turkmenistan, Turkistan or Turkestan, Kyrgyzstan, Uzbekistan, and Kazakhstan. Countries with their names suffixing with 'istan' or 'stan'. could be part of Greater India in its ancient times. '*Sthan/stan'* is a Sanskrit word, meaning 'place'. According to *The Practical Sanskrit-English Dictionary*, by Vaman Shivram Apte (1992:1007), '*sthanam*' means "A state, place, spot, site, locality, station, position, etc." Some say that "istan" is a Persian/Iranian word. It is possible. Both Sanskrit and Avestan have the same or similar word for land. It is known that ancient Sanskrit and ancient Avestan languages were linguistically very close to each other.

History of a country should be its true story right from its birth to the present time. Unfortunately, histories of most colonized countries have been distorted and mutilated to the extent that their respective natives do not know, even unable to know so many important things related to their mother, including her original name, language, age of her scriptures, etc. This is true about India. Even history students of India do not know. How can they know when their professors are ignorant? Most post-independence governments of India, because of their political concerns, do not want historians to reconstruct the history of ancient Bharat.

Pococke (p.1) has observed:

"An illustrious geographer has well observed that the names which geography, particularly physical geography, has consecrated, may be considered the most important documents of primitive history, or of history anterior to

[76] Malte Brun, Geog. Univ.

chronology. … Had that geographical nomenclature been preserved pure and entire, a map of the world might have been obtained, more valuable by far than the Universal Histories."

Pococke (pp.6,7) seems to lament that Greeks have inherited a mass of disfigured documents. This has been made more difficult by the superscriptions of new tales over the old parchment. He seems to believe that fortunately, since no erasures have been made, the text of the old history needs to be restored. But he laments:

"Our way seems effectually barred by the dictum of those theorist who virtually define 'ancient history' as 'invention'. I deeply regret this spirit of theorizing; it has been gaining ground of late years in Germany; and, but recently, its most able exponent in this country has carried this principle into the regions of hypercriticism."[77]

Pococke (pp.6-7) talks about an "able writer" in the Edinburgh Review, who says:

"The real question at issue is not so much whether there was a basis of his historical truth for the poetical legend; whether any such events as the siege of Thebes, or the expedition against Troy, actually occurred; as whether we are now able to extricate this kernel of truth from the mass of fable with which it is overgrown, and to exhibit the naked skeleton of historical fact, stripped of all its coverings of poetical embellishment."

Pococke further writes (pp.7-8):

"When we find the same nation (reference seems to be to India) who were the colonists of Greece, composing not only history but also mathematical treatises in a poetic form, this poetical form will produce, in our minds, no solid objection against the statements contained therein. … What we read as poetry, and legend, was once accredited history, and the only genuine history which the first Greeks could conceive or relish of their past time. Curtain conceals nothing behind, and cannot by any ingenuity be withdrawn.[78]

Pococke (p.8) explains that "the curtain is the picture", the picture is Indian and the curtain is now withdrawn.

British East India Company & Distortion of History

Dr. K. M. Munshi, the founder of the *Bharatiya Vidya Bhavan*, in his foreword to Majumdar's "*History and Culture of the Indian People*" (1988:8-9), points out to the damage, several British scholars have intentionally inflicted on the history of the Indian culture:

"The attempts of British scholars, with the exception of Tod, wherever they have taken these '*histories'* as reliable source-books, have hindered rather than helped the study of Indian history. Unfortunately for us, during the last two hundred years, we have not only to study such histories but unconsciously to mould our whole outlook on life upon them."

The British East India Company employed a well planned three-pronged – missionary, history and education – assault on Hindu culture. Friedrich Max Müller (Bharti, 1992:64-71), basically a missionary, was presented to India as a Sanskrit scholar. He was hired at the age of 25 years in 1847 to translate the *Vedas* into English. If they were really interested in translations, they could have hired an indigenous scholar with proficiency in *Sanskrit* and English*,* authentic historic perspectives on the *Vedas* and with a genuine feel of the *Vedic* religion. Max Müller had

---

[77] See "The History of Greece," by G. Grote, Esq., London, 1849.

[78] History of Greece, vol. I, Preface, p. xiii.

none of the three. Neither English nor Sanskrit was his mother tongue. From the British point of view, his qualification was his firm commitment to his Christian mission. He very tactfully, as said by Bharti[79], hired a couple of impoverished *Sanskrit Pundits* (who could have been easily bribed), got Vedas misinterpreted to humiliate and discredit the Hindu religion and culture. For example, the mantras praising the Indo-Aryan (Hindu) heroes were attributed to the invading Aryans. The ages of the four *Vedas* and the two epics (the *Ramayana* and the *Mahabharta)* have been shortened, so as to validate the ill-founded theory of 'Aryan invasion of India'. The native Aryans were deprived of the credit for having such a great culture and composing the Vadas. Many exponents of the theory wrote that prior to the advent of the light-skinned *Aryans* from Asia Minor, the natives of India were dark-skinned uncivilized *Dravidians* who were allegedly pushed down to the South by the invading Aryans. This sowed the seeds of difference and division between the North and the South. The world is aware of the age-old British doctrine, 'Divide and rule**.'**

Adam Hochschild, reviewing (NY Times, July 24, 2005) the book "*Dancing with Strangers: Europeans and Australians at First Contact"* by historian Inga Clendinnen, writes that the author Inga Clendinnen feels that the British colonizers in Africa and Asia employed the same "divide and rule" tactics. She further remarks that European conquerors did not always meet heroic resistance; in much of Africa, India and Latin America. They succeeded because they could make indigenous groups fight with each other, not against strangers. She remarks:

"History is always written by the victors – at least at first. … Since then, of course, the end of colonialism in Africa and Asia and the civil rights movement in the United States have forced us to start writing history differently. … Yet history remains a messy and complicated business."

The earlier versions of history undoubtedly have a more lasting impact than its later corrected version. The "first history" has typically been written by government-decorated scholars. In such history books, undesired truths are set aside to bring forth a pre-defined agenda. Such government-sponsored books receive extensive readership because of their recognition by schools and colleges as text books. They are given much more shelf space in libraries, particularly in public libraries.

Wolpert's (1993:37) account of "invading barbaric hordes" and their more civilized pre-Aryan 'slaves'" clearly suggests that native *Aryans* were more civilized than the invading *Aryans.* He has characterized the *Aryan* conquest of India as their gradual "institutional assimilation and socio-cultural integration", not as their "overwhelming linguistic, religious and cultural influence" over the native *Aryan* society.

Max Müller worked enthusiastically to project Hinduism in unfavorable colors. His design is well reflected in his letter to Chevalier Bunsen (The Life and Letters of Max Müller,Vol.1:17):

"Your Excellency, … I have no doubt whatever, that something can be written about the *Veda* which would reach even the dullest ears. Nevertheless I, of course, shall be glad if the *Rig Veda* is dealt with in the *Edinburgh Review*, and if Wilson would write from the standpoint of a missionary, and would show how the knowledge and bringing into light of the *Veda* would upset the whole existing system of Indian theology. It might become of real interest. … The Christianity of 19th century will hardly be the Christianity of India. But the ancient religion of India is doomed … and if Christianity does not step in, whose fault it would be?"

---

[79] Bharti, Brahm Dat. *Max Muller:A Lifelong Masquerade.* New Delhi: Era Books, 1992.

Thomas Babington Macaulay, another missionary poised behind the mask of an educationist, told his father in 1836 (Bharti 1992:66) that if his plans of education were followed up, there will be no high caste Hindu left in Bengal after 30 years. Both Max Müller and Macaulay worked hard to disfigure and distort *Vedic* culture with an objective to induce, in Hindus, a cultural inferiority complex. Müller and Macaulay did not succeed that much as they had desired because in those days very few Indians had knowledge of English; and very few among those few did read the books, Müller and Macaulay wrote. Moreover, Indians, in general, were getting correct persectives on their religion and culture from oral traditions by way of *satsangs* in temples and traditional plays from town to town, such as Ram Leelas, Krishna Leelas, satsangs, etc. It seems, Max Müller had changed in his later period of his stay in India. He started talking positive about Hindu culture.

European scholars did the same to the literature on Zoroastrian culture:

"In the area of doctrine, problems arose in the 19th century, when European scholars began to translate and interpret Zoroastrian texts, challenging the traditional view of them. As a result, various reform movements were founded in Bombay, and still remain at variance with one another."

Peter B. Clarke (1993:123)

Dr. K. M. Munshi (in Majumdar, 1951:9) has drawn our attention to the harm several European scholars have intentionally done to Hindu culture: He laments how the failures of Hindus have been highlighted and how their successes have been consistently ignored:

"It (history) does not give us the real India. … During our school or college career, generation after generation were told about the successive foreign invasions of the country, but little about how we resisted them and less about our victories. We were taught to decry the Hindu social systems; but we have never been told how this system came into existence as a synthesis of political, social, economic and cultural forces; and how it developed in the people the tenacity to survive catastrophic changes."

We can find consolation in Munshi's (in Majumdar, 1951:9) assuring note:

"History, as I see it, is being consciously lived by Indians. History is a witness to the fact that politically motivated recorded history of India has been disappointed by the history given down to us orally by our *Vedas* and *Upanishads.*"

Illiteracy: A Blessing In Disguise

Paradoxically, illiteracy in the villages has been a blessing in disguise. It has saved the "*Jahil*" villagers of India from reading the undesirable material written in history books agains Hindus and their culture. The illiteracy has provided them with cultural immunity. They, unlike the educated elite, have remained ignorant of misrepresentations and distortions of the history and have been correctly informed about their culture and heritage through the oral transmission of Vedic knowledge from generation to generation. It has been better

explained by Dr. Alan Roland, an eminent American psycho-analyst, in his "*In Search of Self in India and Japan*" (1988, p.18):

"British administrative, educational, and missionary attitudes all conveyed intense attitudes of British superiority and Indian inferiority in numerous shades and ways over the two centuries of their colonial presence. This had enormous psychological impact, particularly on the Western-educated elite who were more closely associated with the Raj. Since the men were more exposed to British attitudes than women, they were much more affected by colonial denigration."

In fact, the "educated" elite of India, in order to become learned in a real sense, need to unlearn lot. We Indians have been suffering from an ethno-cultural inferiority complex. It would be beneficial for India and Indians if politicians and academics take active interest in uncovering the truth with respect to the theory of the Aryan invasion of India. Dr. K. M. Munshi (Majumdar, 1951:8) has remarked:

"To be a history in the true sense of the word, the work must be the story of the people inhabiting a country. … The central purpose of a history must, therefore, be to investigate and unfold the values which age after age have inspired the inhabitants of a country to develop their collective will and to express it through the manifold activities of their life. Such a history of India is still to be written".

In conclusion, I would like to say that Hindus indifference to our own history has been invitation to foreigners to write our history. Western historians discarded Indian mythology as history. This was the reason why western scholars did not know true history of ancient India. Matlock, in his *India Once Ruled the Americas* (p.170), explains this: "**The one and only reason why we don't know about India's true role in human history is our self-imposed ignorance of Indian mythology, history, and traditions!"**

Thus history, particularly of ancient India, has been obscured and confused. This has been more adversely affected because of the attitude of indifference towards history on the part of ancient Hindu historians. Lieut. Col. F. Wilford, in the Asiatic Society of Bengal's research series, led by William Jones (1746-94), section: "*On the Ancient Geography of India"* (Vol. XIV, pp.374-376), says that some Puranas have information about the names of some mansions, geographical tracts, mountains, rivers, etc., but without any explanations about them. Wilford also describes his difficulties and frustrations in collecting relevant data, mainly because of lack of adequate cooperation from Pundits and Hindu historians.

If Wilford had received full cooperation and if historians, over the years, referred to the ancient names of the rivers and towns in addition to their respective modern names, we would have been able to get clearer picture of ancient India's geographical spread. The history of ancient India, therefore, has been erroneous and infected with several gaps.

Hertel Brunnhofer, Hertel Husing, and others, however, argue that the scene of the *Rigveda* is laid, not in the Punjab, but in Afghanistan and Iran.

References

Apte, Vaman Shivram. *The Practical Sanskrit-English Dictionary.* Delhi: Motilal Banarsidass

Publishers, 1992.

Asiatic Researches. New Delhi: Cosmo Publications, 1979.

Bharti, Brahm Datt. *Max Müller: A Lifelong Masquerade.* New Delhi: Erabooks, 1992.

Bibby, Geoffrey. *Looking for Dilmun.* New York: Alfred A. Knopf, 1969.

Childe, V.Gordon. *The Aryans: A Study of Indo-European* Origins. New York: Knopf, *1926.*

________ . *New Light on the Most Ancient East.* New York : Frederick A. Praeger, 1953.

_________ . *The Dawn of European Civilization.* London,1950

_________ *. Piecing Together the Past*

_________ *. What Happened in History*, Pelican Books,1943

Coedes, G. *The Indianized States of Southern Asia.* Honolulu: An East-West Center Book, The

University University Press of Hawaii, 1964.

Cunningham, A. *Ancient Geography of India.* London: Trubner 1871.

Durant,Will. *Our Oriental Heritage. New York:* MJF Books,1935.

Goyal, Shankar. *History Writing of Early India: New Discoveries and Approaches.* Jodhpur (India): Kusumanjali Prakashan, 1996.

Hancock, Graham. *Underworld: The Mysterious of Civilization.* New York: Crown Publishers,

2002.

Jones, Sir William. The Fourth Anniversary Discourse: On the Arabs (delivered on 15th

Feb.,1787). In *Asiatic Researches*.(Vol.2,Ch.I, pp5-17).New Delhi: Cosmo Publications, 1979.

Langer, William L (ed.). *The New Illustrated Encyclopedia of World History (Vol. 1 & 2).* New York:Harry N. Abrams, Inc.,1968.

McCrindle, J.W. *Ancient India. Vol. IV,* Bombay,1885.

________ . *Ancient India as described by Ptolemy.* New Delhi: Munshiram Manoharlal Publishers Pvt. Ltd., 2000.

_______ . *Ancient India as Described by Classical Literature.* New Delhi: Munshiram

Manoharlal Publishers Pvt. Ltd., 1979.

_________ . *Ancient India as Described by Megasthenes and Arian.* New Delhi: Munshiram

ManoharlalPublishers Pvt. Ltd.

Majmudar, R.C.(ed). *History and Culture of the Indian People. 1st vol. Bombay:* Bharatiya Vidya Bhavan, 1951.

Matlock, Gene D. *India Once Ruled the Americas.* New York: Writer's Showcase, 2000.

_______ . *The Last Atlantis Book.* Tempe, Arizona: A Dandelion Books Publication, 2001.

_______ . *From Khyber (Kheeber) Pass to Gran Quivira (Kheevira).* New York: Authors Choice Press,2002.

Müller, F. Max. *Science of Language (Vol.I).*New York:Charles Scribner's Sons*, 1891.*

___________ . *Ancient Sanskrit Literature.*

___________ . *The Six Systems of Indian Philosophy.* Calcutta: Susil Gupte (India) Ltd., 1952.

__________ . *India: What Can It Teach Us?* London: New York, Longmans, Funk & Wagnalls Company,1999.

_________ . *History of Sanskrit Literature (2nd edition).* London, 1960.

Müller, Herbert J. *The Loom of History.* New York: Harper & Brothers,1958.

Nadiem, Ihsan H. *Moenjodaro: Heritage Of Mankind.(2nd. revised edition)* Lahore: Sang-e-Meel-Publications, 1995.

Nehru, Jawaharlal. *The Discovery of India.* Calcutta; The Signet Press, 1946

Pococke, E. *India In Greece.* London and Glasgow: Richard Griffin and Company, 1856.

Possehl, G.L. *Ancient Cities of the Indus.* Durham:Carolina Academic Press,1979.

Wheeler, Mortimer. *The Indus Civilization.* Cambridge: Cambridge University Press, 1960.

Wheeler, R. E. M. F*ive Thousand Years of Pakistan.* London: Royal India & Pakistan Society, 1950.



(6131 words)

Chapter 6 The Hymns of Dirghatamas in the Rig Veda

David Frawley PhD

Abstract

One of the most important mathematical contributions of ancient times is the idea of a zodiac or wheel of Heaven of 360 degrees. This discovery is usually attributed by western scholars to the Babylonians of around 400 BCE.

However, the symbolism of 360 relative to a wheel of Heaven is common in Vedic literature back to the Rig Veda itself, the oldest Hindu text, usually dated from 1500 BCE back to as early as 5000 BCE. 360 is a prime number for the Vedic mind. Therefore, along with the decimal system and the discovery of zero, the 360 degree zodiac should be credited to India.

In addition, the twelve signs of the zodiac are generally also credited to the Babylonians and said by modern scholars to have come to India by a Greek influence after the time of Alexander (300 BCE). However, the Vedic 360 wheel of Heaven is also said to be divided into twelve parts. Whether these twelve parts are identical with those of the western signs of the zodiac, is not clear from the Vedas themselves, but it is clear that the idea that the 360 part zodiac could be divided into twelve is also there.

Relative to the Nakshatra system, this 360 degree wheel of Heaven is associated with Nakshatra positions relative to solstice and equinox points that date well before 2000 BCE.

In short, the Vedic knowledge of the 360 degree zodiac is additional proof of the sophistication and antiquity of Vedic culture, that it had reached a high degree of mathematical and astronomical knowledge before 2000 BCE, that is usually only attributed to the Babylonians after 400 BCE.

Dirghatamas was one of the Angirasa Rishis,

Some scholars have claimed that the Babylonians invented the zodiac of 360 degrees around 700 BCE. Many claim that India received the knowledge of the zodiac from Babylonia or even later from Greece. However, as old as the Rig Veda, the oldest Vedic text, there are clear references to a chakra or wheel of 360 spokes placed in the sky. The

number 360 and its related numbers like 12, 24, 36, 48, 60, 72, 108, 432 and 720 occur commonly in Vedic symbolism. It is in the hymns of the great Rishi Dirghatamas (RV I.140 – 164) that we have the clearest such references.

Dirghatamas is one of the most famous Rig Vedic Rishis. He was the reputed purohit or chief priest of King Bharata (Aitareya Brahmana VIII.23), one of the earliest kings of the land, from which India as Bharata (the traditional name of the country) was named.

Dirghatamas was one of the Angirasa Rishis, the oldest of the Rishi families, and regarded as brother to the Rishi Bharadvaja, who is the seer of the sixth book of the Rig Veda. Dirghatamas is also the chief predecessor of the Gotama family of Rishis that includes Kakshivan, Gotama, Nodhas and Vamadeva (seer of the fourth book of the Rig Veda), who along with Dirghatamas account for almost 150 of the 1000 hymns of the Rig Veda. His own hymns occur frequently in many Vedic texts and verses from them occur commonly in the Upanishads as well.

The hymns of Dirghatamas speak clearly of a zodiac of 360 degrees, divided in various ways, including into twelve signs. For Dirghatamas, as was the case for later Vedic astronomy, the God of the zodiac is the Sun God called Vishnu. Vishnu rules over the highest heaven and is sometimes identified with the pole star or polar point, which in the unique view of Vedic astronomy is the central point that governs all celestial motions and form which these are calculated.

According to Dirghatamas Rig Veda I.155.6, “With four times ninety names (caturbhih sakam navatim ca namabhih), he (Vishnu) sets in motion moving forces like a turning wheel (cakra).” This suggests that even in Vedic times Vishnu had 360 names or forms, one for each degree of the zodiac. Elsewhere Dirghatamas states, I.164.36, “Seven half embryos form the seed of the world. They stand in the dharma by the direction of Vishnu.” This probably refers to the seven planets.

Most of the astronomical information occurs in his famous Asya Vamasya Hymn I.164, which also contains many important teachings that found their way into the Upanishads. Much of this hymn can be understood as a description of the zodiac. It begins:

1. Of this adorable old invoker (the Sun) is a middle brother who is pervasive (the Wind or lightning). He has a third brother, whose back carries ghee (Fire). There I saw the Lord of the people (the Sun) who has seven children.

This verse is referring to the usual threefold Vedic division of Gods and worlds as the Fire (Agni) on Earth, the Wind or Lightning (Vayu) in the Atmosphere and the Sun (Surya) in Heaven. The Sun is also a symbol of the supreme light. The Sun or supreme light has seven children, the visible Sun, Moon and five planets.

We should note that the zodiac of twelve signs is also divided into three sections based upon a similar understanding, starting with Aries or fire (cardinal fire ruled by Mars, who in Vedic thought is the fire born of the Earth), then with Leo or the Sun (fixed fire ruled by the Sun), and then with Sagittarius, the atmospheric fire, lightning or wind (mutable fire ruled by Jupiter, the God of the rains).

2. Seven yoke the chariot that has a single wheel (chakra). One horse that has seven names carries it. The wheel has three naves, is undecaying and never overcome, where all these beings are placed.

The zodiac is the single wheeled-chariot or circle yoked by the seven planets which are all forms of the Sun or sunlight. It is the wheel of time on which all beings are placed. The Vedic horse (ashva) is symbolic of energy or propulsive force.

3. This chariot which the seven have mounted has seven wheels (chakras) and is carried by seven horses. The seven sisters sing forth together, where are hidden the seven names of the cows.

The seven planets create their seven rotations or seven wheels. Each has its horse, its energy or velocity. Each has its feminine power or sister, its power of expression. It carries its own hidden name or secret knowledge (symbolically cows or rays). This refers to the astrological influences of the planets.

11. The wheel of law with twelve spokes does not decay as it revolves around heaven. Oh Fire, here your 720 sons abide.

The circle of the zodiac has twelve signs. It has 720 half degrees or twins, making 360 total. The Shatapatha Brahmana X.5.5, a late Vedic text, also speaks of a wheel of heaven with 720 divisions. “But indeed that Fire-altar is also the Nakshatras. For there are twenty seven of these Nakshatras and twenty-seven secondary Nakshatras. This makes 720.” Twenty-seven times twenty-seven Nakshatras equals 729, with which some overlap can be related to the 720 half-degrees of the zodiac.

12. The Father with five feet and twelve forms, they say, dwells in the higher half of heaven full of waters. Others say that he is the clear-seeing one who dwells below in a sevenfold wheel that has six spokes.

The five feet of the father or the Sun are the five planets or the five elements that these often refer to (to which Vedic thought associates the five sense organs and five motor organs in the human body). His twelve forms are the twelve signs. The Sun in the higher half of heaven with the waters is the signs Leo with Cancer (ruled by the Moon), with the other five planets being the five feet, each ruling two signs. In Vedic thought, the Sun is the abode of the waters, which we can see in the zodiac by the proximity of the signs Cancer and Leo.

The sevenfold wheel is the zodiac moved by the seven planets. The six spokes are the six double signs through

which the planets travel. The same verse occurs in the Prashna Upanishad I.11 as a symbol for the year.

13. Revolving on this five-spoked wheel all beings stand. Though it carries a heavy load, its axle does not over heat. From of old it does not break its ancient laws.

The five-spoked wheel is again the zodiac ruled by five planets and five elements and their various internal and external correspondences.

14. The undecaying wheel (circle) together with its felly (circumference), ten yoked to the upward extension carry it. The eye of the Sun moves encompassing the region. In it are placed all beings.

This may again refer to the ten signs ruled by the five planets, with each planet ruling two signs. The eye of the Sun may be the sign Leo through which the solar influence pervades the zodiac or just the Sun itself. The upward extension may be the polar region.

15. Of those that are born together, the seventh is born alone. The six are twins (yama), Divine born rishis. Their wishes are apportioned according to their nature. Diversely made for their ordainer, they move in different forms.

The six born together or are twins are the twelve signs, two of which are ruled by one planet (considering the Sun and Moon as a single planetary influence). The seventh that is singly born is the single light that illumines all the planets. Elsewhere the Rig Veda X.64.3 speaks of the Sun and Moon as twins (yama) in heaven.

The planets are often associated with the rishis in Vedic thought, particularly the rishis Brihaspati (Jupiter), Shukra (Venus) and Kashyapa (the Sun) which became the common name for the planets. Their ordainer or stabilizer may be the pole star (polar point).

48. Twelve are its fellies. The wheel is one. It has three naves. Who has understood it?

They are held together like spokes the 360, both moving and non-moving.

This is perhaps the clearest verse that refers to the zodiac of twelve signs and three hundred and sixty degrees. The same verse also occurs in Atharva Veda (X.8.4). The zodiac has three divisions as fire, lightning and Sun or Aries, Sagittarius and Leo that represent these three forms of fire. The 360 spokes are the 360 degrees which revolve in the sky but remain in the same place in the zodiac.

Yet another verse (43) of this same hymn of Dirghatamas refers to the Vishuvat, the solstice or equinox, showing that such astronomical meanings are clearly possible.

If we examine the hymn overall, we see that a heavenly circle of 360 degrees and 12 signs is known, along with 7

planets. It also has a threefold division of the signs which can be identified with that of fire, wind (lightning) and sun (Aries, Sagittarius, Leo) and a sixfold division that can be identified with the planets each ruling two signs of the zodiac. This provides the basis for the main factors of the zodiac and signs as we have known it historically. We have all the main factors for the traditional signs of the zodiac except the names and symbols of each individual sign. This I will address in another article.

Elsewhere in Vedic literature is the idea that when the Creator created the stars he assigned each an animal of which there were originally five, the goat, sheep, cow, horse and man (Shatapatha Brahmana X.2.1). This shows a Vedic tradition of assigning animals to constellations. The animals mentioned are the man, goat, ram, bull and horse, which contain several of the zodiacal animals.

The Zodiac and the Subtle Body

Clearly this hymn contains a vision of the zodiac but its purpose is not simply astronomical, nor is the zodiac the sole subject of its concern. Besides the outer zodiac of time and the stars there is the inner zodiac or the subtle body and its chakra system. In Vedic thought the Sun that rules time outwardly corresponds inwardly to Prana, the spirit, soul or life-force (Maitrayani Upanishad VI.1). Prana is the inner Sun that creates time at a biological level through the process of breathing.

In Vedic thought (Shatapatha Brahmana XII.3.28) we have 10,800 breaths by day and by night or 21,600 a day. This corresponds to one breath every four seconds. The text says that we have as many breaths in one muhurta (1/30 of a day or 48 minutes) as there are days and nights in the year or 720, so this connection of the outer light and our inner processes is quite central to Vedic thought.

In Vedic thought the subtle body is composed of the five elements, the five sense organs and five motor organs, which correspond as the five chakras of the subtle body. On top of these five are the mind and intellect (manas and buddhi) which are often compared to the Moon and the Sun. They can be added to these other five factors, like the five planets, making seven in all. The chakras of Dirghatamas, though outwardly connected to the zodiac, are inwardly related to the subtle body, a connection that traditional commentators on the hymn like Sayana or Atmananda have noted.

The hymn of Dirghatamas contains many other important and cryptic verses on various spiritual matters that are connected to but go beyond the issues of the zodiac or the subtle body. It is written in the typical Vedic mantric

and symbolic language to which it provides two keys;

39. The supreme syllable of the chant in the supreme ether, in which all the Gods reside, those who do not know this, what can they do with the Veda? Those who know it alone are gathered here.

45. Four are the levels of speech. Those trained in the knowledge, the wise know them all. Three hidden in secrecy cannot be do not stir. Mortals speak only with the fourth.

There is clearly a hidden knowledge behind these verses, which reflect an esoteric tradition of spiritual knowledge that was mainly accessible for initiates. We cannot simply take such verses superficially but must look deeply and see what they imply. Then the pattern of their inner meaning comes forth. If we do this, the astronomical and astrological side cannot be ignored.

Western scholars of the history of astronomy like David Pingree have accepted the astronomical basis of this hymn and that it clearly refers to the zodiac. However, to maintain a late date for Vedic astrology, he assumes that this hymn or its particular astronomical verses were late interpolations to the Rig Veda, around 500 BCE or about the time of the Buddha. This is rather odd because the Buddha is generally regarded as having come long after the Vedic period, while the actual text is usually dated well before 1000 BCE (some have argued even to 3000 BCE). In addition, the hymn, its verses and commentaries on them are found in many places in Vedic literature, along with support references to Nakshatras. It cannot be reduced to a late addition but is an integral part of the text. That being the case, the zodiac of 360 degrees and its twelvefold division are much older in India than any Greek or even Babylonian references.

Pingree also tries to reduce the ancient Vedic calendar work Vedanga Jyotish to 500 BCE or to a Babylonian influence. However, the internal date of this late Vedic text is of a summer solstice in Aslesha or 1300 BCE, information referenced by Varaha Mihira in his Brihat Samhita (III.1-2). “There was indeed a time when the Sun’s southerly course (summer solstice) began from the middle of the Nakshatra Aslesha and the northerly one (winter solstice) from the beginning of the Nakshatra Dhanishta. For it has been stated so in ancient works. At present the southerly course of the Sun starts from the beginning of Cancer and the other from the initial point of the sign Capricorn.” The middle of Aslesha is 23 20 Cancer, while the beginning of Dhanishta (Sravishta) is 23 20 Capricorn. This is a date of around 1300 BCE.

There are yet earlier references in the Vedas like Atharva Veda XIX.6.2 that starts the Nakshatras with Krittika (the

Pleiades) and places the summer solstice (ayana) in Magha (00 – 13 20 Leo), showing a date before 1900 BCE. These I have examined in detail in my book Gods, Sages and Kings (Lotus Press/Motilal Banarsidass, 1991). Clearly the Vedas show the mathematics for an early date for the zodiac as well as the precessional points of these eras long before the Babylonians or the Greeks supposedly gave them the zodiac.

Commentary by Dr.Suvarna Nalapat

David Frawley's scholarly study shows some light upon the antiquity of the vedas and the astronomical knowledge of India .To have that knowledge in a particular era,a nation/people might have thought about it for several centuries prior to that.In fact Dheergathamas ,belonging to Kaasi royal clan is a raajarshi ,(disciple of Angirasa gothra to which Krishna also belonged in later years)and a medical person.The numbers used by the upanishadic rishi,by the medical personnel,and the musicians of India are the same showing an interdisciplinery approach to all their sciences and arts,and this itself is an evidence that they have not borrowed anything from Greece or Rome. The ancient musical system and astronomy use the same numbers and Greece never had a music system compared to Indian classical music ,and the cosmic and biological proportions used by Indians being the same all have a common origin from a single seed of Brahma.To have such a advaithic interdisciplinery approach to art and science as early as the Rgvedic period ,the Indian rishiparampara had experimented with each branch of science and art and assimilated and integrated them into a significant whole.

The naadalayayoga or the ancient music therapy of the early saamavedins is based on the proportions David Frawley has mentioned here.Hence these calculations are not only for the cosmos,for the biological system ,for the astronomical and mathematical sciences but also for Indian classical music and the science of sound ,breath,light ,and yoga in general.

This point was highlighted in my commentary to Varahamihira's panchasidhanthika (first ed 1990,second ed 2000,NBS Kottayam).

According to vansavali in Bhagavatha Dheergathanas is said to have blessed the 20th king Bali with 6 sons who ruled the east part of India (Anga,kalinga,sunmha,pundra,vanga,and Andhra)Bali is the successor of the Anu clan(brother of king Pooru)and hence belong to dynasty of Pururavas and Urvasi.Dheergathamas is 13th generation from kshathravridha (Brother of Nahusha)and when the 20th generation had no kings /successors he (already an aged Muni)blessed the Anu saakha to have sons.Dhanwanthari was son of dhhergathamas(14th)and Divodasa was 18th king of the kasi saakha. Chithrarathan who adopted Santha of Dasaratha(father of Rama)was 25th king of Anu's clan and he had blessings of Rishyasringha to

have successors to his throne.This shows ,Dheergathamas lived centuries before Rama was born and the antiquity of veda and its knowledge.

Since India had a long chronology of kings and emperors and of the Guruparampara of these kings ,the awareness of documenting history was also prevalent in the ancient system of knowledge.Dheergathamas lived during the era of Parasuraama(while Parasurama was a child)and Rama lived at the fag end of Parasurama's life.

Vedas were reconstructed or created by Pururavas the first Rajarshi of this clan and the time span between Deergathamas and Rama(13th of Kshathravridha and and 57th of the Vikukshi dynasty is important since divodasa,thrasadasyu etc were kings belonging to these two clans and not any foreign slaves(as the term dasa was interpreted by many historians).These were mentioned in vedas and were rulers who ruled as servants of God.

(The term daasa just denoted the servitude to divine law)

The article of David Frawley is therefore very significant .(from the historical point of view)

Dr Suvarna Nalapat



(3313 words)

Chapter 7 Daevas and Asura: The ongoing battle between Iconism and Aniconism

Anirban Banerjee PhD

Professor of Surgery

Abstract: The story of the Churning of "ocean" as told in Vishnu Purana and Ramayana is well known in India. In this Indian Itihasa, the Devas led by Indra emerged as the reigning deities in India and were helped by Vishnu in several ways. The Asuras lost and were 'driven' away. In contrast, the Avesta identifies the Asura as being good and the Devas as deceitful. This is by no means the only known struggle between the Asura ad Devas.

Curiously the oldest Rg identifies some of the major deities including Varuna as an Asura. Significantly most of these Vedic deities (Indra, Varuna, Pushkar) are largely forgotten in India today, with Vishnu and Shiva coalescing out of the Rudras, (both mentioned a very few times) now being principal.

Both Devas and Asura are directed/mentored/advised by their own divine priests Brihaspati and Sukracharya ((of the line of Brahma rishis Angiras, and Bhrigu lineages respectively). Both of these gotra/clans played important roles in compiling the Veda and are mentioned many times in various scriptures. What were they teaching/preaching to their adherents?

As the outcome of the Churning suggests, the Team-Devas won, and an Iconic god who incarnates, responds, intercedes, can be propitiated in millions of zoological forms with yagna, sacrifice, for both general and specific help as ritually taught since the Atharva Veda.

The Avesta retains a view of an Aniconic Ahura Mazda, a formless non-personifying deity. If so could the teaching of certain Bhrigu priests within India also have been continuing to emphasize the Aniconic? Sankaracharya (750 AD) with his Advaita, synthesized these didactical opposites into a grand unification: Nirguna Monism. Whilst Buddhism was overthrown, India is been merely reintroduced to Brahmanical Brihspasti and the Daevas. In this study we examine evidence for the shifting battelelines between Iconism (Idolatry) and Ancionism (Advaita) and how this Churning maybe going ongoing today.



(327 words)

Chapter 8 Need of the hour -- Indian Ethos for history writing.

M. A. Jayashree PhD

Prof. M. A. Narasimhan

The idea of removing distortions and rewriting Indian history is really the need of the day. But unfortunately the very attempt has landed into a quagmire of controversy as historians of repute are wrangling about what is distortion and what is not. This is resulting in the general public to disbelieve the whole exercise. But the most disconcerting part in the debate has degenerated into personality attacks and abuse than a healthy academic discussion.

One has to remember that India has been the only country in the world which honed into perfection the process of academic debate where the search for truth was of ultimate importance and it was not to be restrained by one's ideology, impression or belief. It was in India, maximum intellectual freedom was given to debate on any aspect of knowledge. Freedom of expression, public debate, acceptance of the superior logic totally was the hall mark of India. It is also a fact that either the social stance and understanding or the intellectual stand taken by an individual or group regarding an issue was never allowed to come in the way of social harmony or friendship between the academic antagonists. This noble tradition to decide issues on academic merit and with the ultimate aim of truth being supreme has to be revived. Then alone we can think of a History which is to say the least will be least controversial.

Before going to distortions and rewriting, let us examine what are the inputs that help a historian in reconstructing the history. For him the sources are mainly the

1. Archeological artifacts

2. Inscriptions

3. Contemporary literature.

Even though Archeological artifacts, inscriptions can be considered as the best of evidences in formulating history, they naturally limit our study in terms of time frame to one or two millenniums. As the material in which it is written and the writing also along with the artifacts disappears due to the ravages of time, it makes the restructuring of history incomplete. This can be seen more vividly in the case of ancient civilizations like that of India which dates back to hoary past crossing at least one more millennia. This is where we need to recourse to folk tradition mores etc. of the Indian culture which can throw more light on to many puzzling factors in History. It accounts for the strange turns in history and so on. But the problem that has been facing the historian is how to

authenticate the folk lore etc which is generally an oral tradition which has also taken local variations over time leading to many visions of the same episode. So how are we to analyze the contents of folklores and traditions?

It is here we feel that we can get the technique that our Rsis had perfected to wrest the truth from this knowledge bases. They have brought into perfection the analysis of any statement thoroughly. That is how to squeeze out the purport, intent, authenticity etc. of a statement. They have used this technique to verify the truth of statements made in the scriptures. These go under the name of six systems of philosophies. Now we feel it is possible to use the same norms to be applied to the statements of folk lore too.

With this idea in background, this paper tries to apply certain norms that were used by the Rsis of yore in streamlining the discussions so that it can lead to tangible and useful practical results.

All discussions without a clear basic framework which is mutually agreed upon will be an exercise in futility. This lack of consensus and the intentional confrontationist's attitude has been forcing the society at large to throw the claims of the legitimate and the illegitimate both to the dustbin. A heavy loss indeed! It has been the tradition of India that any branch of knowledge, if it has to be considered as essential part of human knowledge, it should be capable of clearly enunciating its goal, course and the source. Without clearly demarking the purpose, no knowledge system should start its enunciation.

If so, what would be the Indian perspective and approach to history? Traditionally acclaimed historian of India Kalhana who wrote the Rajatarangini says,

"Dharmaartha-kaama-moskshanaam upadesa-samanvitam |

Puraa-vrttam, kathaa-rupam Ithihaasah pracakshate ||"

History will be the narration of events as they happened, in the form of a story, which will be an advice to the reader to be followed in life, to gain the purusaarthas namely Kama the satiation of desires through Artha the tool, by following the path of Dharma the human code of conduct to gain Moksha or liberation. .The Kalhanian formula seems to be the ideal perspective to be followed in writing history. For we feel that it will avoid to a large extant the subjective distortion that has invariably been creeping in to the histories written so far.

By accepting such a norm, History becomes relevant and contemporary and accepting the logic of the six systems of philosophy by which one can fine tune the authenticity of a statement based on just oral tradition along with the objective evidence of the artifacts available. That apart we also have the clear enunciation of the way of life (Dharma) enunciated in the smrtis. This can be applied at three stages Namely Dharma of nature, human dharma, and locational dharma. This helps one to come to conclusions which can be fairly logical and acceptable to the majority. It is after all, the conclusions that lands historians into controversy. The more objective it is, more comprehensive it is, more purposeful it is, will naturally lead to the reduction of controversies.

The norms developed on this basis and also based on the definition of truth in which our scholars of yore have done an in depth study, if applied to history writing, we are confidant that it will lead to the writing of not only Indian history but also the history of the different countries and civilizations of the world which will be acceptable to one and all.



(1026 words)

Chapter 9 Ancient Indian Dynasties

Vishnu Swaroop Misra

Published by: Bharatiya Vidya Bhavan (Date of release: October 2007)

Synopsis

While there is no dearth of publications on the history of ancient India, the coverage of its political aspects has, so far, been comparatively neglected. The scholars attribute this mostly to lack of recorded history on the Greek or Roman pattern. Many of them do, however, accept the authenticity of Vedic literature in such matters but not being history oriented, these offer only scant and some disjointed material for writing the political history of that period. The comment generally, barring a few exceptions, on the traditional source of history in India viz. Puranas, has been that the material contained therein, besides being based on traditions, is contradictory not only within individual Puranas but also between different Puranas and is not in harmony with Vedic and Buddhist evidence though the grounds on which the latter – also based on traditions- has never been disclosed.

Several scholars have made efforts to rectify these shortcomings but apart from some notable exceptions, they relied almost wholly on one source or the other. There has been no attempt so far to synchronize the testimony of all sources i.e. Vedic, Puranic, Buddhist, Jain, classical Sanskrit works, archaeology etc. The Project in hand is an endeavor to achieve the same objective and the conclusion emerging so far is that the task can be accomplished.

Bearing in mind the circumstances in which the works coming under different classifications mentioned above were composed, examination of more than twenty dynastic lists mentioned in the Puranas indicates that though the Puranas describe them as a continuous lineal succession, most of them and specially the major ones such as Ikshvakus, Purus, Yadus etc. are a mixture of several independent branch lines – some collateral, some genuine successors and some which in reality ruled only after a gap as a consequence of the original line coming to an end. The other problems such as wrong origins, divergences between the accounts appearing in different Puranas, internal contradictions within individual Puranas etc., wherever they occur, can be sorted out. As a sample, the annexure to this Note provides some details of the final conclusions on one of the Aila dynasties.

After rectifying the dynastic lists of the Puranas, it is possible to synchronize them with Vedic, Buddhist, Jain and classical Sanskrit literature testimony carrying out such adjustments as may be necessary since the latter also suffer from identical aberrations caused by almost the same environment and conditions which affected the Puranas. Major findings of this research are listed below.

The number of generations between Manu Vaivasvata and the Bharata battle would be approximately 50 as against 91 mentioned in the existing Puranic texts. Rectified Aila dynasties covering Purus, Bharatas and Kurus also

indicate almost the same number of successions. The total number of successions in the dynasty established by Yadu is also the same after rectification.

The dates of Nirvana of Buddha-and Mahavira, which have been the subject of controversy for centuries- has been worked out in a manner which satisfies Puranic, Buddhist and Jain traditions as also the evidence emerging from archaeological discoveries. These revised dates are 514 B.C. and 527 B.C.

After rationalizing the post Bharata War reign periods of the kings of Barhgratha dynasty of Magadha keeping in mind the dates of the Nirvana of Buddha and the coronation of Ashok Maurya, the date of Bharata War has been fixed in 1157 B.C. Similarly, the date of Parikshit I has been estimated as 1328 B.C. and the Battle of the Ten Kings can be fixed as 1360 B.C. The time of Dasharatha and Rama has been worked out as 1378 B.C. and 1328 B.C. respectively.

More than 30 major synchronisms have been identified on the basis of the evidence contained in the Puranas, Vedic, Buddhist, Jain texts and classical Sanskrit literature to help reconstruction of the political history of ancient India.

ANNEXURE

Major Puranas like Va, Vs etc. contain nearly 23 dynastic lists. At this stage it would, perhaps, be appropriate to illustrate the application of our methodology by picking up a dynasty dealt with in the Puranas- say Puru dynasty, as it is termed by the historians.

Puru was the sixth descendant of Manu Vaivasvata. After Puru, the Puranas record a continuous line of 50 successions up to the times of Mahabharata War. On the other hand, three collateral lines were established immediately after him by his sons but the Puranas have merged all three of them and presented it as a continuous line of succession. Later, it is again a mixture of three independent dynasties established by the Purus, Bharatas and Kurus. All the three dynasties were not founded simultaneously though, after a certain stage, all three of them were in existence. One of the three lines established by the sons of Puru was replaced by the Bharatas who continued to rule until they were displaced by the Kurus. The remaining two Puru lines became dormant but after some time one of them resurfaced and displaced Kurus who had earlier routed the Bharatas. Purus managed to set up two dynasties one of which was suppressed by the Kurus but the second one continued to rule till the days of Mahabharata war . Further, Kurus were an independent tribe and they were not related either to the Purus or the

Bharatas. Similarly, Bharatas were also very distinct from the Purus. In fact, two of them namely, Purus and Bharatas took part in the "Battle of Ten Kings". The most revealing feature of the incessant wars between these three tribes was that at the time of Bharata Battle all three were in existence and all of them participated therein- Purus and Bharatas joined hands and fought against the Kurus. Another interesting finding is that all the three tribes after founding their kingdoms went into oblivion after some generations as a consequence of their defeat at the hands of one of the remaining two but they reappeared also at a later stage at the expense of the tribe which had defeated them earlier. While the details of these developments are given in the chapter titled " Purus, Bharatas and Kurus", the findings in respect of other dynasties narrated in the Puranas are no less revealing as the sequel would show.



(1054 words)

Chapter 10 Vishaal Bharat: Borderless World of Vedic Culture

Jagat K. Motwani, Ph.D.

This paper will historically establish, beyond any doubt, that ancient Bharat was the cultural empire of the world. It is based on objective interpretations of what has been written by various scholars about the history of ancient India. It would have been easier to rewrite the distorted history of ancient India if the original names of the countries, ancient India was related to, were known. History is rewritten by the victors, with their primary purpose, to reintroduce their own ethnic identity, by erasing and confusing, the ethno-cultural identity, of the natives of their colonies.

Henry Stierlin has said "*India is often referred to as a 'subcontinent."* In fact, ancient India, was much larger, than a continent. In ancient times, the Hindu culture pervaded the whole world. It is evidenced by the title of Stephen Knapp's book, "Proof of Vedic Culture's Global existence." History, as written by a few historians of professional integrity, tells that India, in its ancient times, culturally ruled over the whole planet. All this is adequately supported documented evidences.

Afghanistan was a part of India

The present-day city of Kandahar was Gandhara, named after the Mahabharat queen Gandhari. David Frawley writes that the name Gandhara is mentioned in the *Rig Veda.*

Ghaznavy destroyed many Hindu and Buddhist worship places and changed names of rivers etc. But a few were left. Presence of Buddhist statues in Afghanistan, and Hari Rud the name of a river suggest that its natives before Afghans were Buddhists and Hindus. Afghans could not be there before 7th century.

Alexander Cunningham in his book " *The Ancient Geography of India"* writes that the people of whole Afghanistan spoke Indian language and practiced Hinduism and Buddhism:

Cunningham further states : "During the whole of the tenth century, the Kabul valley, was held by a dynasty of Brahmans, until the reign of Mahmud Ghaznavi.

India was in Central Asia

Most countries in Central Asia, particularly those with their names ending with 'stan' or 'istan', such as – Balochistan, Afghanistan, Tajikistan, Turkmenistan, Turkistan, Kyrgyzstan, Uzbekistan, and Kazakhstan – could be part of Greater India in ancient times. '*Sthan/stan'* is a Sanskrit word, meaning 'place'. When drawing a line around these istan countries, beginning at Kazakhstan, in the extreme northwest, and ending at Pakistan, they make a block connecting with India. These countries were snatched away one by one by Muslim tribes. Last being Pakistan.

History doesn't reveal the original names of these countries, before they were re-named, by their invaders. The most recent example of Pakistan, will explain, how the history is distorted, by the invaders. A book, entitled "Five Thousand Years of Pakistan", was published by Pakistan govt., in !950, when Pakistan was, not even three years old. The book doesn't talk about Hindu religion or culture, although Buddhism has been mentioned. Most of the book, is filled in, with the pictures and description of, Islamic tombs, mosques, and forts etc.



I have been able to get a book, The Soul of Kazakhstan, authored by a Kazak, Dr. Alma Kunanbay. Its contents, when objectively analyzed, implicitly suggest, that the ancestors and the heritage of Kazakhs, have very close

religio-cultural association, with none but Bharat.. The flap of the jacket of the book reads:

Kazakhstan is rich in culture, tradition and spirituality, that dates back thousands of years. Until recently, it was little known, outside the region, because it lost much of its identity and heritage, under the 70-year domination of the Soviet Union, and before that, the Russian Empire. Since independence in 1991, Kazakhstan is reestablishing its own identity. Kazakhs, who have been taught under the Soviet system, that their nomadic heritage was worthless, are rediscovering their roots, and an inherent richness, that many of their generations had not known.

The book does not clearly mention, who were the ancestors of the Kazakhs, and what was their original religion and culture. But, as per what Dr. Kunanbay, has described the culture of the Kazakhs: “(Kazakhstan) is rich in culture, tradition and spirituality that dates back thousands of years”, it can be interpreted with fair certainty that their religion and culture, do not seem to have their origin in Islam.

Most of its elements, as described below by her, seem to be similar to those of Hinduism.

On page 60, Dr. Alma talks about Kazakhs’ close relationship, with nature, their veneration of mountains, caves, rivers, and lakes, and their worship of deities of fire, sky, earth, water, and fertility. It is surprising to see that the name of the “protectress of fertility” is ‘Umay’ – very close to ‘*Uma*’, wife of *Shiva*, the god of fertility. She describes the burning incense at a sacred place (p.72), solar deities (*Surya Devta),* and “Mother Earth” (p.53), and describes Kazakhstan, as “the spiritual cradle”. Spirituality and knowledge (*gyan*) have been significant ingredients of the Kazakhstan’s philosophy – similar to those of Hinduism. Their reverence of fire is incorporated into many rites and rituals.

Sufism in Kazakhstan

Dr. Alma (p.60) remarks that Sufism is well known in the southern region of Kazakhstan.

Tocharian Documents in Brahmi Script:

Tocharian was spoken in the Chinese Turkestan, an other istan country. Some Tocharian documents were found written in Brahmi script. It suggest that its speakers and their land must have some relationship with India and influence of Sanskrit there.

Iran: An Abode of Aryans?

Culturally and linguistically, ancient Iran was very similar to India. Geoffrey Bibby has said that “… so was Iran governed by India in ancient times.” Dr. Peter B. Clarke (ed.), in *The World’s Religions* writes that the name ‘Iran’ is derived from ‘Aryan’. He seems to suggest that Iran, in ancient times, was inhabited by Aryans. The old Iranian

language Avestan was very close to Sanskrit. C.V. Vaidya, in *History of Sanskrit Literature* observes that there is significant similarity between Avestic gathas and Rigvedic mantras. He continues: "There is no doubt that the Indo-Aryans and Iranians once formed one people and lived together."

Mallory states that according to Burrow, Indo- Aryans were once the occupiers of Iran.

Persia, name after Parsooram, the warrior with Axe

Pococke writes: "…. The PARASOOS, the people Parasoo-Rama, those warriors of the Axe, have penetrated into and given a name to PERSIA; they are the people of Bharata (India)." Pococke (p.47) writes about the colonies ancient Indians established in Persia, West Asia, and Caucasus:

Hindus were in Mesopotamia and Central Asia

Pococke, in "India in Greece" (pp.45,46), talks about presence of ancient Hindus in Mesopotamia, West Asia and in Central Asia. He further writes, that an emigration took place from Indian districts of Bopalan, meaning Bhopal, and Bhagulpoor. . They established their colonies, along the southern banks of the Euphrates in Mesopotamia (present Iraq).

India in Egypt

British Lt. Colonel Francis Wilford, in Sir William Jones', Asiatic Researches, has given abundant evidence proving that ancient Indians colonized and settled in Egypt. Pococke, in his "*India in Greece"* (p.45), writes that that he has glanced at the Indian settlements in Egypt.

Hindus in ancient Mecca

Captain Wilford in Asiatic Research documents tells the story of two doves "found by Mohammed in the *Cabba* at *Mecca;* which they claim, with some reason, as a place of worship belonging originally to the *Hindus."*

India in Europe

Sacred Hindu Isles in the England?

Wilford also talks about the White Islands (*Swetadweepa)* in the British Isles as the Sacred Isles of Hindus. John Bently, in Asiatic Researches (pp.377-497), talks about the influence of the *Vedas* in Europe and Persia.

Hindus in ancient Greece

Garraty & Gay have said about presence of Aryans in Greece. Pococke, in his *India in Greece*, has established with evidences Greece was once a colony of Vedic people. He remarks: "Now, the whole of this state of society, civil and military, must strike every one as being eminently Asiatic; much of it Indian."

Swastika: A Sacred Symbol of the Celts

The *Swastika has been* found all over Europe in ancient times. It suggests Vedic influence all around. The following quotation from the book, *The Celts: Sacred Symbols* (1995), would explain the influence of *Hinduism* on the Celts which spread in Europe, including British Isles and Germany: "One of the great enduring symbols of the Ancient World, the *Swastika* had wide currency as a sign of good luck and of solar beneficence."

A seal with Swastika was found in Mohenjodaro, Indus Valley civilization



A seal excavated from Mooanjodaro

Far South East Asia under Vedic Influence

Garraty and Gay (1972:355-357) speak about the cultural influence of India, in Southeast Asia:

“Culturally, the strongest external influence, on early Southeast Asia, was exercised by India. Hinduism and Buddhism, spread widely in the area.”

Philip Rawson, in his: “*The Art of the South East Asia”* writes about Hindu colonization of the Far South East Asia. He remarks:

“The culture of India has been one of the world’s most powerful civilizing forces. Countries of the Far East, including China, Korea, Japan, Tibet and Mongolia, owe much of what is best, in their own cultures, to the inspiration, of ideas imported from India. The West, too, has its own debts”.

Hindus in Indo-China

According to *The World Book Encyclopedia*, Hindus and Buddhists, had established their kingdoms, in Indochina and Indonesia. Indochina includes Cambodia, Laos, and Vietnam, with Ankor as its capital.

India in Indonesia

Similarity of the Indonesian, language with Sanskrit, as reflected by the names – *Sumatra, Sukarno Putri, Suhato, Jaya, Kalimantan, Jakarta, meaning Jaya-karta, Yogiakarta, Surakarta, Madura, Sukabumi,* etc. – and their worship, of ancestors and nature, and Bali Hinduism, all seem to suggest, close relationship of its people, in remote ancient times, with Hindus and Buddhists. One of its island is called Irian Jaya, meaning Aryan Jaya. Its traditional music instruments have close similarity to Hindu music instruments. Its citizens are called bhoomi putra.

The Hindu kingdom, of Madjapahit controlled much of Indonesia in 1300 century A.D. In 1400's Islam began to spread.

India in Americas

Some of the native American Indians from India?

Several characteristics – such as the *Swastika*, cremation, a priestly caste, brownish complexion, incarnated gods, sacrifice rituals, worship of nature gods (fire, rain, earth, trees, sun, etc), worship of the serpent god *(Nagdevta)***,** pottery, textiles, half-man half-animal god, carving of wood, blowing of the conch (*Shankh***)** in temples, carvings of pillars and elephant on one Maya temple, oral transmission of religious poetry from generation to generation – of American Indians, as written by William Brandon, Harold E. Driver, and Henry B. Parkes, seem to be similar to those of the people of the Vedic India. All this supports my theory that some of the migrants, who traveled from Asia to Americas via Siberia, Bering Strait and Alaska, during Ice Age, over ten thousand years back, were Vedic Aryans from India.

India in South America

Sir William Jones, in Asiatic Researches, writes about INCAS (royal families) of South America, as the descendants of Sri Rama:

It is very remarkable that the Peruvians, whose INCAS boasted of the Rama descent, styled their greatest festival RAMA-Sitva; whence we may suppose that South America was peopled by the same race who imported into the farthest parts of Asia the rites and fabulous history of Rama.

India in ancient Africa

Stephen Knapp, in *Proof of Vedic Global Existence,* writes:

In ancient Vedic lore, Africa was know as Kusha Deep or Kushadvipa. Two reasons for this are because large stretches of land were covered by the tall grass known as kusha grass in Sanskrit, and after the war between Rama and Ravana, the continent was under the administration of Rama's son Kush or Cusha. African school text books also describe Africans as Cushites, testifying to the above information.

Knapp adds that when Swami Krishnanand hesitantly presented a copy of the Ramayana to Christian monarch Haile Selassic, the monarch responded: "This is nothing new to us. We Africans are Cushites." This motivated Krishnananda to research African text books. He found references of Africans designated as Cushites.

Knapp writes:

"The text books provided more evidence of Africa's ancient administration of Cusha. However, the text books wrongly mention Cusha's father as Ham instead of Ram. As previously explained, that is because Rama was spelled in western regions as Rhama. In course of time the "R" was dropped and what was left was 'Ham'."

India in Mauritius

Knapp writes:

"Other strong Ramayanic links with Africa can be recognized in the island of Mauritius off the eastern (I think western) coast of southern Africa. The island gets its name from "Marichas," meaning the island of Marichi, who was one of the generals in the army of the demon Ravana, and also a name of the sun. Rama, however, routed all the demons out of the area during the war with Ravana, and made Marichi flee to the stronghold of the demons."

India all over the globe

Sir William Jones, in Asiatic Researches, talks about various other Hindu colonies all over the globe: "Of the cursory observations on the Hindus, which it would require volumes to expand and illustrate, this is the result: *that they had an immemorial affinity with the old* Persians, Ethiopians, Egyptians, the Phoenicians, Greeks, Tuscians the Scythians or Goths, and Celts, the Chinese, Japanese, and Peruvians."

In conclusion, it can be said that influence of the Vedic culture pervaded all over the globe. Hindus and Buddhists had culturally colonized some countries, but not by force. It was by the nature and the essence of their philosophies which attracted the worldwide peoples.

Muscle also needed, along with culture

India would have been able to sustain its ancient global cultural empire, if it had preserved Lord Krishna's military muscle. I prefer Krishna's Ahimsa, "violently crush those who are out to kill the innocents" to Gandhi's Ahimsa "Give the other cheek," to keep the invaders out. Both Krishna and Gandhi earnestly believed the Vedic tenet, "Ahimsa paramo-dharma", meaning nonviolence is the Muscle.



(2120 words)

Chapter 11 Is It an Enlightened World?

Joginder Singh, IPS (Retd.) Former Director, CBI, India

There are different views about the history. “He who has money, lives long: he who has authority, can do no wrong: he who has might, establishes right. Such is history”. Gottfried Benn. A slightly but almost similar view was held by Henry Ford On History' ”I don't know much about history, and I wouldn't give a nickel for all the history in the world. History is more or less bunk. It is a tradition. We want to live in the present, and the only history that is worth a tinker's damn is the history we make today. Essentially History is written about the winners and rulers and often at their instance. Each one of us, and each family has its own history. Some of us do write our autobiographies, which in passing may mention about the contemporary situation. But that view would be personal and to some extent based on the existing situation. It is said that Mehmood Gaznvi, a king wanted the poet Firdausi to write a treatise praising his achievements. The understanding with the king was that he would pay one gold Mohar or a coin, for every verse. The poet completed the book. But the king backed out. So the poet died heart broken, after writing condemnatory verses about the king. In any case, it depends as to whose side, or on whose behalf you are writing. All history, essentially is the history of the rulers.

So it cannot be ruled out, that History could be an aggregation of truths, half-truths, semi-truths, false hoods fables, myths, rumours, and prejudices. In the modern democracies, only an independent media, can write the truths. But it is a truth as presented to it or as interpreted by it. Government of the day, quite often, would not allow the truth to be presented, because it may appear to be too bitter. Aurangzeb one of the Moghul rulers was the worst of a religious fanatic, who used power and pelf to convert Hindus to Islam. Jadunath Sarkar feels that Aurangzeb intended nothing less than to establish an Islamic state in India, an objective that could not be fulfilled without "the conversion of the entire population to Islam and the extinction of every form of dissent"; and to render this scenario more complete, he proposed that the jizya (poll-tax) on non-Muslims, which Aurangzeb had re-instituted in 1679, was aimed at forcibly converting Hindus to Islam, He enforced Islam and Islamic law on India”. Yet for the purpose of vote bank politics, some political parties, have been taking the stand in India, that we should not say the things, which divide Indians. There is an official dictat, not to mention about his atrocities or the exploitation of India, by Muslim rulers.

Fortunately, they have not expurgated the history books, about a dozen or so attacks of

Ahmed Shah Abdali, whose sole purpose was to loot India. That was the purpose of all foreign rulers, like the Mughals,, Suri Tribe, of Sher Shah Suri, and many others.. Infact, the Capital of India, has an important road named Aurangzeb Marg, after him.

On the contrary, his victim, the 9th Sikh Guru in the officially prescribed history text books was painted as a depredator and a dacoit. This was recently deleted, modified, when the Sikhs raised the matter strongly. The so called loyal historians have debunked and even cast doubt about the existence of most revered Hindu deities Lord Krishna and Lord Rama. So much for the so called historians, who believe and write, keeping in view, which side their bread is buttered. If the historians were to ask for the birth certificates of Lord Rama or Lord Krishna from the Municipalities of Ayodhya, now called Faizabad, or from Mathura, they would not be able to get the same. For that matter, it would be equally true of the birth certificates of Lord Budha from Lumbini, or Guru Nanak from Talwandi or Guru Gobind Singh from Patna, Municipality, or Jesus of Nazreth or about Prophet Mohammad Sahib. Traditions and folk tales passed from generation to generations are a fairly reliable source of history.

The present Government of India takes the cake in the matter of interpreting the history. In an affidavit filed over the Sethusamudram project, the Central Government Wednesday told the Supreme Court on 11th Septemeber, that there was no historical evidence to establish the existence of Lord Rama or the other characters in Ramayana.

In an affidavit filed before the apex court, the Archaeological Survey of India (ASI) rejected the claim of the existence of the "Ramasetu Bridge" Referring to the Ramayana, the affidavit said there is no "historical record" to incontrovertibly prove the existence of the character, or the occurrences of the events, depicted therein.

In affidavit in the Supreme Court, it says about Sethusamudram: Ramayana is not a historical record; and provides no proof of its characters.

The Centre today told the Supreme Court that “contents of the Valmiki Ramayana, the Ramcharitamanas by Tulsidas and other mythological texts, which admittedly form an important part of ancient Indian literature... cannot be said to be historical record to incontrovertibly prove the existence of the characters, or the occurrence of the events, depicted therein.”

If you were to ask for the records of battle between Alexander the Great and Indian King Porous, you would not get the same. It is only the tradition, which says that a battle took place, in which Alexander treated Porous courteously, as he was impressed by his courtesy and bravery. History books record and it was taught to us as students, that when Alexander asked Porous, the defeated king, as to how he should be treated, Porous replied that he should be

taken care of and accorded the same courtesies as one king extends towards another king. Similar is the case with the traditional information passed on about the prophets and rulers by word of mouth from generations to generations

Most historians either copy the works of each other or give their own interpretations of how things should have happened. India did not have any system of maintaining any records of governance, till the British came to this country.

All over the world, there is a kind of inbuilt tendency to slur over the personal lives of rulers, unless the history cannot be explained without bringing in that particular incident. Ramayana is based on the story of kidnapping of Sita by the demon king Ravana and how the evil is triumphed over by the good. Similar is the case of sexual molestation and an attempt to strip off, Draupadi , the wife of the Pandus, the five brothers, by Duryodhana. Even about Jawahar Lal Nehru, Pamela daughter of Edwina Mountbatten, has said that her mother had special relationships with the then Indian Prime Minister. But the sexual escapades do not take away the greatness of anybody. Somehow all over the world, we expect our icons to be totally asexual, which is neither psychologically nor physically possible Article 19-(1) (a) of The Constitution of India provides that “all citizens shall have the right to the freedom of speech and expression.” The Supreme Court of the Country has ruled that; “There can be no doubt that freedom of speech and expression includes freedom of propagation of ideals, and that freedom is ensured by the freedom of circulation

There are different views about Mohandas Karam Chand Gandhi, whom many consider as the Father of the Indian Nation. “The tendency towards backroom wheeling and dealing did not entirely escape Gandhi himself as he rose to become the Indian National Congress's most influential political leader. (See Collected Works, vol. 24, p.170, vol. 12, p.381) Ifact, in 1914, he was still very much in awe of the British empire, and Martin Green in his biography of Gandhi describes his state of mind as follows: "When Gandhi left South Africa, he still believed in the British empire, though tentatively. "Though Empires have gone and fallen, this empire may perhaps be an exception....it is an empire not founded on material but on spiritual foundations....the British constitution. Tear away those ideals and you tear away my loyalty to the British constitution; keep those ideals and I am ever a bondsman"." (See Martin Green, Gandhi: Voice of a New Age Revolutionary, p. 208)

"Nadir Shah looted the country only once. But the British loot us every day. Every year wealth to the tune of 4.5 million dollar is being drained out, sucking our very blood. Britain should immediately quit India.'' So wrote the Sindh Times on May 20, 1884, a year before the Indian National Congress was born and 58 years before the ''Quit India'' movement of 1942 was launched.

But the Gandhi of 1914 was quite far removed from the most radical elements of the Indian Freedom Movement. In 1913, poor emigrant farmers from the Punjab in California launched the Ghaddar Party and released their manifesto calling for complete independence from British Rule. Although Gandhi was critical of specific aspects of colonial rule, in 1914, his general outlook towards the British was more akin to that of the loyalist Princes than the most advanced of India's national leaders. Particularly onerous was his support of the British during World War I. Even as the Ghadar Party correctly saw in WWI a great opportunity for India to deepen its opposition to the British, and liberate itself from the colonial yoke, Gandhi instead tried to mobilize Indians on behalf of the British war effort. Although many biographers of Gandhi have studiously omitted making any mention of such dishonourable aspects of Gandhi's political life, Martin Green makes a brief reference to Gandhi's attitude towards WWI when he was in England: "To return to London in wartime: Gandhi quickly raised his ambulance corps amongst the Indians in England. As before, he had offered his volunteers for any kind of military duty, but the authorities preferred medical workers". Martin Green also observes: "Many of his friends did not approve the project. Olive Schreiner, who was in London, wrote him that she was struck to the heart with sorrow to hear that he had offered to serve the English government in this evil war - this wicked cause". (See Martin Green, Gandhi: Voice of a New Age Revolutionary, p. 247)

Gandhi's ideas on non-violence did not then extend to the British Imperial War, and upon his return to India in 1915 attempted to recruit Indians for the British War effort. Gandhi justified in his mind support for the imperial war, his attitude towards the revolt of Chauri Chaura (1921), where freedom fighter burnt a police station, with some policemen in it, Gandhi wrote thus: "God has been abundantly kind to me. He has warned me the third time that there is not yet in India that truthful and non-violent atmosphere which and which alone can justify mass disobedience....which means gentle, truthful, humble, knowing, never criminal and hateful. He warned me in 1919 when the Rowlatt Act agitation was started. Ahmedabad, Viramgam, and Kheda erred. Amritsar and Kasur erred. I retraced my steps, called it a Himalayan miscalculation, humbled myself before God and man, and stopped not merely mass civil disobedience but even my own which I knew to be civil and non-violent" . (See Collected Works, vol. 22, p.415-21)

Subhash Chandra Bose wrote: "To sound the order of retreat just when public enthusiasm was reaching the boiling point was nothing short of a national calamity. The principal lieutenants of the Mahatma, Deshbandhu Das, Pandit Motilal Nehru and Lala Lajpat Rai, who were all in prison, shared the popular resentment. I was with the Deshbandu at the time, and I could see that he was beside himself with anger and sorrow." (quoted from The Indian Struggle, p.90) To describe Gandhi's decision as a "national calamity" was indeed right on the mark. To lay such stress on non-violence - that too only three years after he had been encouraging Indians to enroll in the British Army was not only shocking, it showed little sympathy towards the Indian masses who against all odds had become energized against their alien oppressors.

For Gandhi to demand of the poor, downtrodden, and bitterly exploited Indian masses to first demonstrate their unmistakable commitment to non-violence before their struggle could receive with Gandhi's approval (just a few years after he had unapologetically defended an imperial war) was simply strange. Obviously, Gandhi had one standard for the Indian masses, and quite another for the nation's colonial overlords. Many would call it Gandhi's tactical and ideological hypocrisy.

In much of Motilal Nehru's correspondence with his son, (and with others in the Congress), there are expressions of frustration with Gandhi's tendency towards moderation and compromise with the British authorities and his reluctance to broaden and accelerate the civil disobedience movement. Motilal Nehru and Subhash Chandra Bose both complained of Gandhi's tendency to ignore party resolutions when they went against his wishes, and to work with cliques rather than consult and cooperate with all party members. Bose's historic election signified the mood of the Indian masses, who were becoming increasingly impatient with Gandhi's tepid nationalism. Bose had always strived to accelerate the freedom struggle, and the mass of Congress Party workers appreciated his sincerity and unswerving commitment to the national cause. In many ways, he was the best person to lead the Congress, with intellect and vision that exceeded Gandhi. But Gandhi, along with Patel and Nehru formed a tactical block against Bose, and prevented him from functioning effectively as leader of India's pre eminent national organization. In vain did Bose make his case with Nehru, who remained unmoved, and eventually, it led to Bose having to quit the Congress, and organize outside it's tedious confines. In the context of Bhagat Singh's hanging, even as Gandhi condemned the British government, he observed: "The government certainly had the right to hang these men. However, there are some rights which do credit to those who possess them only if they are enjoyed in name only." (See Collected Works, vol. 45, p.359-61, in Gujarati)

Whether Gandhi was confusing the term "right" with the term authority or might, or he actually granted the colonial government the "right" to execute Indian freedom fighters is hard to accept.
If he really felt that Bhagat Singh's death sentence was wrong, he would have spoken of how the British were able to execute him only because of their military might, not because of any ethical or moral justification. History is nothing, but writing of the events as interpreted by the writer, mostly with an eye to prove a point. Nowhere even in current history is a mention of Anti Sikh Riots of 1984, after the unfortunate assassination of Indira Gandhi. No historian will ever mention or keep a record about the utterance of Late Rajiv Gandhi, that " Teach Them (Sikhs) a Lesson" or "When a big tree falls, the earth is bound to shake". These are the quotes from the newspapers of those days and how the Government of the day, let the mass murders of about 5000 people go on, despite a Sikh being the President of India and right in the Capital of the country. Similarly, the history books sketchily mention and sometimes do not mention about the migration of 50 million people and killing of 5 millions Hindus and Sikhs in 1947 from the areas which now form Pakistan. How distorted is history, which can be seen from the

following news item, which appeared in one of the newspapers in India on Friday, September 14, 2007, over Lord Rama;

“For historians, Ram remains a myth

“NEW DELHI: Did Ram exist? It's a question that has pitted historians against believers time and again. While historians cite lack of evidence to say Ram was a mythical personality, those who believe otherwise claim that significant evidence exists to confirm that Ram existed in flesh and blood. So, where does the truth lie?

According to R P Tripathi, professor of ancient history at Allahabad University, "History requires concrete evidence in the form of coins, inscriptions, etc to prove the existence of a character. Even if we take into account places mentioned in the Ramayana like Chitrakoot, Ayodhya, which still exist, the fact is that Ramayana is not a historical text. So, from that perspective, there is no historical evidence available of Ram. Having said that, we still cannot negate Ram's presence easily, since he has been a part of our collective consciousness for a long time."

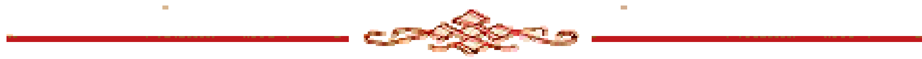
"In fact, it is precisely because of this, that we cannot look at Ram objectively, since he has made the transition from being simply a character in an epic to a religious figure," says S Settar, former chairman of the Indian Council of Historical Research. "In mythology, there are many characters who have been similarly mentioned. Does that mean that they all existed?" he asks. So, are all mythical texts just that — only myth? Or, is there, somewhere, a grain of truth in them?" Myths have to be carefully interpreted to find that grain of truth. In Ramayana's case, there is no evidence to prove that it is anything else except a myth. There is also no evidence — either historical or archaeological — which proves that Ram ever existed or that he ruled Ayodhya," claims Settar.

However, there are some who beg to differ. "If archaeology cannot prove whether a temple existed at Ayodhya or a mosque just 500 years ago, what help can it render in establishing historical events more than 7,000 years ago?" asks Pushkar Bhatanagar, author of the book, Dating The Era Of Lord Ram. "If the masons of those times failed to construct buildings which could survive seven millennia, an inference should not be drawn that the country had no inhabitants at that time or that Ram is a myth," he adds. However, history requires substantial evidence that can satisfy all academics, says R S Bisht, former Jt DG of the ASI. "Historical evidence has been found about such personalities as Ashoka, who left behind edicts. Unless similar evidence is found about personalities like Ram, it will be difficult to prove their existence," he says.

Will such evidence ever be found, considering that the cities of that time have been built several times over? Nobody knows. For the time being, however, Ram remains a myth, at least in the eyes of history”.

He who has money, lives long: he who has authority, can do no wrong: he who has might,

establishes right. Such is the history, says a historian.



(3107 words)

Chapter 12 Is history important?Why study history at all?

Suvarna Nalapat Ph.D

Past is the prologue of the future.

From the past we learn our mistakes as well as our potentials for growth and development.Hence study of history is important. Selfanaysis is good for future systematic planning to achive success and for an aimoriented approach.

Is chronology important and if so why?

Chronology means a chronological succession of events.This is a relative phenomenon since it is strictly regional.To make it meaningful ,we have to compare the chronologies of two or more regions ,or better still ,the chronology of a series of world events with a simultaneous event in the cosmos(in the world of stars and cosmos)then it becomes meaningful.Otherwise ,the chronology as such (without these)has no meaning in history.So,the development of a system which draws the chart of the position of heavenly bodies ,in relation to the fixed stars and in relation to an event on earth(be it the birth of an ordinary/royal/divine child or the coronation of a king to start a new branch of royalty called a saaka)means that people have developed a sense of theory of relativity .It is very simple to understand that .But the lack of interdisciplinary awareness of our scholars makes it difficult for them to understand this significance.

The statement in the rgveda when the yagna was being conducted such and such asterisms were on the sky denotes this high thinking capacity of our ancestors.the gene of that ancestor is in us.that is one of our potential .The gene of the warring tribes also is there(unfortunately).The scholars are happy to inherit the warring gene,and that makes all the difference between a discussion and a mudthrowing between scholars .(when they disagree)

I would suggest the scholars to read the chronology given in scriptures and then compare it with the known lineages of kings available from different states (old empires and royalty ,from rishi or guru parampara)and this **geneology** to be compared with the astronomical combinations.without doing thtat just saying that the chronology is a myth and /or it is

absolutely true is not an objective approach.For this an extensive study is needed.compilation of results of various people and making it into **a metascience would** be ideal.

What should be the principles behind the study of history?

Every people(nation)has a unique geographic and climatic history which shapes their economy,trade,social relationships,customs,dresscode etc.This natural geographical features are responsible for our unique developments of culture.

India is having a **monsoon tradewind** starting from the Arabian sea and from the bay of Bengal at clockwork precision ,cyclical and this determines our economy,trade,navigational history,cultural and philosophical peculiarities etc.Even the townplanning,Vaasthu,construction of portcities,smallscale industries,defence strategies,shipbuilding and navigation are all because eof the proximity to sea and the monsoon winds and the availability of numerous riverways for inland transports.

Hence the study of these features and the subaltern history of the people should be given more importance than the chronology of political leaders of the present.The navigation of the naasatya and Bhujyu in rgveda shows that they knew the secret of tradewind from the time of rgveda.(at least)and for that thousands of years of observation of monsoons,starwatching for finding the spatial relationship,complicated mathematics,and production of goods(agricultural and others)for profit making,weight and measures for trade etc must have developed.The fact that veda speaks of these itself show that they were not inland people ,but people who were wellversed with the sea and searoutes.The migration of birds and animals,etc also mentioned in the Rgveda as a corollary to this.The rishi parampara of Rgveda if closely followed ,and then compared with the Mahabharatha parampara will give some very interesting facts .(which we will discuss later)

The current chronology is insufficient because it is very relative and does not even attempt to correlate with chronologies of other parts as a **metascience** should do.

The Europeans are blamed for everything by the present Indian scholars for our decline.Nobody thinks that it could be the other way round also.The local chieftains who were warring with each other for political supremacy control of trade and commerce and economy were actually inviting the new traders to help them in destroying the fellow countrymen.And ,naturally ,they

did help.But ,they understood the weakness of desire in these chieftains and behaved in the sam e coin to them.I think ,that is only human nature.There is no need to criticize colonizers for everything.We have to do a selfanalysis from the past history and realize that we were over desirous of power and money and luxury and that was the caus eof misery for us. British rule had actually given a new regeneration to our thinking process which was numbed by the incessant wars between petty chieftains.If they have done some mistakes,the reason was our petty nature and their ignorance of the past of India ,being foreigners.That is a pardonable mistake.because they were outsiders .But unpardonable on our part who are insiders and yet don't know anything about ourselves,our weaknesses and our strengths-potentials and the drawbacks.History should be in such an objective way to make our younger generation realize both. Not just glorification ,not just criticism either. Be objective. Find out our strengths, potentials and develop them and be glorified with real reason.

This would be the best method.The very English language with which we now communicate globally,the irrigation systems, better research tools and technology were all the regenerative processes the colonizers started in India.So ,untoward criticism may be avoided.Selfcriticism will promote development (Not the criticism of others .Ofcourse they too might have been responsible but not to the same extant as we are. The recognition of this fact makes us more wise).But that also should be with a problemsolving attitude.We should be able to give solutions.to the current problems we face from our assessment of the past history .Otherwise just the study of history becomes useless .

Think where we went wrong,what went wrong,and how best we can correct them ,

Not who was at fault .

Yes .History is definitely important.But not to increase separatist feelings among citizens but to improve our social ,economic and political conditions by learning from past mistakes and for better management ,administration ,and for understanding the gene and the brain of our ancestral stock which we too have inherited as a genetic/environmental potential and to behave in a rational manner for th e betterment humanity ,for the betterment of entire world. That is the message of India and its great civilization that history should convey.

The Europeans are blamed for everything by the present Indian scholars for our decline.Nobody thinks that it could be the other way round also.

I have a slightly different approach to this issue. First of all it is not a question of who is to blame. Clearly it is the Indian people who are responsible for their own welfare and for defending themselves. In the final analysis it is we who are to blame for letting our land become a place where every marauder thought it was an easy prey for conquest. That is not in question. What is in question is whether the present recounting of our history is an accurate one or not. My fundamental assumption which I will call

The Underlying premise

The present narration of our history especially in the English language is not accurate and is fundamentally flawed both chronologically and as to the nature of the content . There should be no question in anybody's mind that the present narrative of our history as taught to our children is the legacy of the British . I would be astonished if anybody were to contradict me on this assumption. This is therefore not an opinion but a fact..

My question is if we are generally agreed that the above is true , why are we continuing to teach our children what is patently false and is written by someone who has no accountability or even the responsibility to tell the truth . The British may be a nice people but that does not mean they are under any responsibility to write an accurate account of Indian history. If indeed as some feel that history is written by the victor, the victor has long since left our shores and we should rewrite it to conform to our own puranic history , which contrary to what most people think is the most comprehensive account of any ancient civilization that is still extant

Quote

The local chieftains who were warring with each other for political supremacy control of trade and commerce and economy were actually inviting the new traders to help them in destroying

the fellow countrymen.And ,naturally ,they did help.But ,they understood the weakness of desire in these chieftains and behaved in the same coin to them.I think ,that is only human nature.There is no need to criticize colonizers for everything.

I am not interested in the many reasons as to why Britain invaded India in an unprovoked manner. They behaved no differently than any imperial power intent on enriching themselves at the expense of the people they subjugated. Compared to most imperial powers they behaved a tad better, but the performance bar is so low that is hardly a compliment. I certainly do not blame them for what they did, because as an imperial power they were under no obligation to be nice to the people they conquered. On the contrary they are to be admired for their patriotism to their own country. Even a pirate and a Buccaneer like Francs Drake was knighted by Q E I for enriching his mother country. I consider Robert Clive to be among the same class of pirates and buccaneers as Francis Drake. Robert Clive had ambitions to become a Prime Minister of England, but even in merry olde England they balked at the idea of a bandit like Robert Clive becoming the Prime Minister. (see the book by Nicholas Dirk[80] on "The Scandal of Empire" for a systematic account of the looting of India). Again there is no question of blame. It is merely a question of telling the true history of India

Quote

We have to do a self analysis from the past history and realize that we were over desirous of power and money and luxury and that was the cause of misery for us. British rule had actually given a new regeneration to our thinking process which was numbed by the incessant wars between petty chieftains.If they have done some mistakes, the reason was our petty nature and their ignorance of the past of India ,being foreigners. That is a pardonable mistake.because they were outsiders

This is the single biggest point of our disagreement. Why should we absolve the British of the responsibility for their acts of greed and rapacity merely because we have shortcomings? We may have any number of faults, but how that gives an excuse for the British or anybody for that matter to behave the way they did is beyond me. In any event why we should be rationalizing the behavior of the Brits is not clear to me. The British are already doing an outstanding job of rationalizing away their rapacious behavior, that they certainly dont need any assistance from me on this matter. Not a single Briton has ever asked me what i thought of British rule in India. I neither blame them nor absolve them.

---

[80] Dirks, Nicholas, The Scandal of Empire, Belknap Harvard, 2006

Quote

But unpardonable on our part who are insiders and yet don't know anything about ourselves,our weaknesses and our strengths-potentials and the drawbacks.History should be in such an objective way to make our younger generation realize both.Not just glorification ,not just criticism either.Be objective.Find out our strengths,potentials and develop them and be glorified with real reason. This would be the best method.

I have no problem with the above statement, which is one of the reasons why we are having the seminar.

Quote

The very English language with which we now communicate globally,the irrigation systems,better research tools and technology were all the regenerative processes the colonizers started in India.

There is more to this point than meets the eye. I will be happy to discuss this in person with you.

For starters, let me recount what is by now well known. from the "Colonial Legacy" by M. Kaul, S.Thadani

"*Several Indians are deeply concerned about why literacy rates in India are still so low. So in the last year, I have been making a point of asking English-speaking Indians to guess what India's literacy rate in the colonial period might have been. These were Indians who went to school in the sixties and seventies (only two decades after independence) - and I was amazed to hear their fairly confident guesses. Most guessed the number to be between 30% and 40%. When I suggested that their guess was on the high side - they offered 25% to 35%. No one was prepared to believe that literacy in British India in 1911 was only 6%, in 1931 it was 8%, and by 1947 it had crawled to 11%! That fifty years of freedom had allowed the nation to quintuple it's literacy rate was something that almost seemed unfathomable to them. Perhaps - the British had concentrated on higher education ....? But in 1935, only 4 in 10,000 were enrolled in universities or higher educational institutes. In a nation of then over 350 million people only 16,000 books (no circulation figures) were published in that year (i.e. 1 per **20,000)."***

As for Public works (like irrigation systems) "

In 1854, Sir Arthur Cotton writing in "Public Works in India" noted: "*Public works have been*

almost entirely neglected throughout India... The motto hitherto has been: 'Do nothing, have nothing done, let nobody do anything....." Adding that the Company was unconcerned if people died of famine, or if they lacked roads and water.

Nothing can be more revealing than the remark by John Bright in the House of Commons on June 24, 1858, "*The single city of Manchester, in the supply of its inhabitants with the single article of water, has spent a larger sum of money than the East India Company has spent in the fourteen years from 1834 to 1848 in public works of every kind throughout the whole of its vast dominions.*"

Quote

So ,untoward criticism may be avoided. Self criticism will promote development (Not the criticism of others .Ofcourse they too might have been responsible but not to the same extant as we are. The recognition of this fact makes us more wise).But that also should be with a problem solving attitude.We should be able to give solutions. to the current problems we face from our assessment of the past history .Otherwise just the study of history becomes useless

This is not entirely clear to me . One can be objective and critical at the same time. In fact it is our duty to be critical (of oneself and of others) when the situation arises. The only requirement is that we should be faithful to the truth as we perceive it. See my Core Values which is a shared Google document[81]

(2529 words)



[81] We have added in the appendix a vignette on Famine during the Colonial period. The facts are damning. The extent of the deaths is staggering, 26 million in a short period between 1876 and 1904. We mention this because the Colnial overlord makes it a point to say that his stewardship of the subcontinent was a relatively benign one, but the callousness of the Viceroy , during the famine bespeaks otherwise and the crediblity of those who make such statements is severely impaired. Again we are reminded of Napoleon’s dictum, attribute not to malice that which can be explained by incompetence. The colonial overlord was woefully incompetent in the governance e of such a huge and complex geography as India.

Chapter 13 Ancient Leadership Model, the Rigvedic Purohita.

Oleg Perzashkevich, Ph. D

ABSTRACT

The present paper is about the ancient Vedic social phenomena of purohita, his functions and specificity during the time of Rigveda. The existing Indological academic point of view and the absolute majority of Indian religious traditions regard purohita as “a family priest, a domestic chaplain of the king”. However this understanding is based usually on post-Rigvedic texts. As for the Rigvedic society itself, purohita usually does not mean so much the certain priestly position or function, but has been understood or as a complex past participle passive whether from purodhA- “to put ahead”, or from purohi- “to send forward”; or as one of the common words for “priest” as it is. We consider, that the Rigvedic situation gives us much more detailed definition for this concept – a particular function of priesthood but also (what is not usually noticed for Rigvedic purohita) as a political and even military leader. Rigveda provides us the following evidence: a) the initiator of the dialogue between people and gods; b) the intermediary between people and gods; c) the founder of human society principles; d) the defender of the initial supreme principles; e) a herald-standard-bearer; f) a powerful embodiment of valour and supreme order.

Keywords: purohita, qualities and duties, priest-initiator, political leader, Rigvedic period

Index Words: purohita, Rigvedic period

Any question on the system of religious authority in ancient societies always appears to be a key point, regarding its exclusive role to be played by religion and mythology in those societies. Such problems attract even more interest, when they touch societies, which did not know the developed state yet. The Rigvedic society is undoubtedly belongs to such ones. The additional urgency to a consideration of the system of priestly authority at the RV society, or even to its separate elements, is being given by the fact that the one is the earliest of known historical Indo-Iranian societies and one of the earliest Indo-European ones.

The present paper put its attaention to purohita, his functions and specifics inside the RV

society.

According to the European academic tradition, this word has the meaning of “domestic royal priest” [f. e. *Macdonell A. A., Keith A. B. Vedic Index of Names and Subjects. Vol.II. Delhi-Varanasi-Patna, 1958. P. 5-6, Елизаренкова Т. Я. Словарь основных мифологических и ритуальных понятий // Ригведа. Мандалы I - IV. М., 1989. С. 761*].

However, those works are usually touching the period more recent that the RV one. Regarding the RV society, the basic point is that the word purohita did not mention as particular priest duties or function, but one should realise it:

A. literarily, as a complex past participle passive of purodhA- “place in front of” [f. e. *Böhtlingk O., Roth R. Sanskrit-Wörterbuch, I - VII. - St. Petersburg, 1853 - 1875. Th. IV. S. 804, Mayrhofer M. Kurzgefasstes Etymologisches Wörterbuch des Altindischen. Bd. 1 - 4. - Heidelberg, 1956-1980. Bd. II. S. 310, Ригведа. Мандалы I - IV // Изд. подготовила Т. Я. Елизаренкова. М., 1989. С. 545*] or of purohi- “being sent ahead” [*Rgveda - SaMhitA with English Translation by Svami Satya Prakash Sarasvati and Satyakam Vidyalankar, I - XIII. - New Delhi, 1977 - 1995. Vol. II. P. 424*];

B. somebody who possesses a special power and keeps a special position for everybody, who considers his as a magic and ritual protection from any danger, i. e. the priest as he is [f. e., *Hillebrandt A. Vedic Myphology. Vol. II. Delhi, 1990. P.100. Gonda J. Triads in the Veda. Amsterdam 1976. P. 148*].

If to go deeper, we should mention the basic positions, which formed all the more recent academic views:

1. Grassmann Hermann. Wörterbuch zum Rig-Veda. - Weisbaden, 1955.

A. purohita

1) performing an action, f. e. placed on top to declare a speech.

2) a priest, place on the top.

3) a domestic priest (in particular).

4) Agni's characteristics.

B. purohiti

a priest service or job.

2. Monier-Williams, Monier. Sanskrit-English Dictionary, Oxford, 1899.

A. purohita

placed foremost or in front , charged , commissioned , appointed;

m. one holding a charge commission, an agent (esp.) a family priest , a domestic chaplain (RV. &c. &c.)

B. purohiti

f. priestly ministration (RV.)

So, we can summarise that the current vision of purohita gives us no any detailed enough priest function, just general direction of understanding. We consider, that this view does not match the RV situation too close, and our own version of that institution, based on our conceptual description methodics, gives us a little bit different understanding. Let us show this in detail.

The Vedic purohita is a complex word, derived from puras “farther, ahead” and hita- “given, placed, sent, established”. Semantically this definitely correlates with Avestan paradAta “given in front of, placed ahead”. However, the Old Inranian tradition connects paradAta with military or royal function, but not with the priesthood at all [f. e., *Грантовский Э. А. О распространении иранских племен на территории Ирана // История Иранского государства и культуры. М., 1971. С. 319, Авеста: Избранные гимны; Из Видевдата / Пер. с авест., предисл., примеч. и словарь И. М. Стеблин-Каменского. М., 1992. С. 202*]. Furthermore, the more recent Indian tradition – *ManavadharmaZastra XII 46-48* – also places purohita not to brahmaNa, but to kSatriya.

So, according to semantics, purohita may be realised as the one, who starts the process of conversation of people and gods (some sort of the mediator) — “the first one, whom the gods are listening to” — and as a founder of the structurized (organised) society – “the father-founder of the people”. Going further, regarding the proposal of S. Prakash and S. Vidyalankar, purohita is the one who is sent to declare something very important – “a herald-banner-bearer”. If so, we can definitely consider this as an indication not to the pristhood, but to

political or military-political functions. And it is more important that it made not some sort of abstract starting point or foundation but the very particular notion for the people who used the word purohita. So, the present question is which detailed elements of that foundation the RV people themselves considered to be essential. Looking for the answers let us review the RV text, taking into our consideration the relative chronology of the RV, proved by H. Oldenberg and confirmed by T. Elizarenkova [*Елизаренкова Т. Я. Ригведа — великое начало // Ригведа. Мандалы I - IV. М., 1989. С. 473 - 479*].

Early RV Period = Family MaNDalAh

(purohita RV II 24,9; III 2,8; III 3,2; III 11,1; V 11,2; VI 70,4; IX 66,20)

(purohiti RV VII 60,12; VII 83,4)

Regarding those passages, the early RV society defines purohita as possessed with both pristly and military qualities. His priestly side has been described with the following characteristics and correlations.

correlations	**characteristics**
saMnaya- “direction”	brahmaNas pati- “lord of brahman”
vinaya- “teaching”	mati- “thought”
dhiyAvasu- “with rich thought”	jAtavedasa- “born by knowledge”
veda yajNam AnuSak “sacral knowledge	hotar “hotar”
barhis “sacrificial straw”	havyadAti- “bringing a sacrifice”
sumna- “god's mercy”	ghRtaZriyA- “depicted with ghee”
hotar “hotar”	ghRtapRcA- “brought by ghee”
vipra- “singer of holy hymns”	pavamAna- “soma sacrifice”
yajNa- “sacrifice”	RSi- “poet-rishi”
brahman “brahman”	
havIman “appeal”	
ghRta- “ghee”	

Rta- “Cosmic order”	

His military side can be depicted as follows.

correlations	**characteristics**
yudhi- “battle”	vAja- “might”
ratha- “charriot”	rathin- “charriot driver”
dUta- “messanger, missioner”	ketu- “standard, banner”
	sukratu- “mightiest”
	rathIr Rtasya “the driver of Cosmic order”

The following elements are considered to be the general ones for both functions:

svasti	“wealthy”;
svasti	“big prosperity, greater family”.

Early-Middle RV Period = Early Additions to the Family MaNDalAh

(purohita: RV I 55,3; I 58,3; I 94,6; I 128,4)

So, in the Early-Middle RV Period purohita can be also described as possessing both priestly and military functions. The first is shown as:

The second is defined with:	
correlations	**characteristics**
nRmNa- “military valour”	sukratu- “сильнейший”

vIra- "mighty warrior, hero"

ugra- "might, power"

ratha- "charriot"

iSu- "arrow"

sukratu- "forth"

vahni- "cabman"

vedha- "piercing"

The following element is considered to be the general one for both functions:

dhIra- "skillful".

Late-Middle RV Period = Late Additions to the Family MaNDalAh

(purohita: RV I 1,1; I 44,10 + 12; VIII 27,1; VIII 101,12)

So, the Late-Middle RV Period indicates purohita as the priest. Below you can see his specification. The only thing to be specialy noted is that his correlation with gods (Agni and Surya) and with the eternal light marked purohita's cosmogonic capacities, but the other elements shows his connection to human society.

characteristics	correlations
Rtvij- “put sacrifice in order”	yajNa- “sacrifice”
mitramaha- “great friend”	hotar “hotar”
antara- “favourite”	grAmin “common human being”
grAvANas “pressure stones”	agni- “fire”
barhis “mat of sacral grass”	uktha- “praise”
	adhvara- “rite”
	sUrya- “Sun”
	vibhu jyotir adAbhyam “all-embracing endless

Regarding the non-priestly elements for that period, we have identified only two of them:

characteristics	correlations
avitar “assistant, protector”	
dUta- “missioner, messenger”	

They could probably be considered as related to the military functions.

The following element is considered to be the general one for both functions:

mAnuSa- “human being”.

Late RV Period = Last – the Xth – MaNDala

(purohita: RV X 1,6; X 66,13; X 70,7; X 92,2; X 98,7; X 122,4; X 150,4-5)

Examining the latest part of the RV, we have concluded the following.

Priestly indications:

characteristics	**correlations**
	aruSo jAta- “born of scarlet colour”
	pada iLAyA- “place of pleasure”
	Rta- “Cosmic order”
	hotar “hotar”
	Rtvij- “the one who put the sacrifice in order”
	yajNa- “sacrifice”
	uSas “dawn”
	hotra- “hotar duty”
	kRpaya- “co-feeling pity”
	dhI- “thought”
	agni- “fire”
	vasiSTha- Vasishtha (rishi's name)

Again we should noticed that the connection of purohita to Agni and Ushas and their cosmogonic functions is evident.

Here are the purohita's military indications for that period.

characteristics	**correlations**
yahva- “tireless”	rAjan “king”
prathama- “first”	yajNasya ketu- “banner of sacrifice”
vAjina- “mighty”	

The following element is considered to be the general one for both functions:

draviNa- “wealth”;

napAt- “son”.

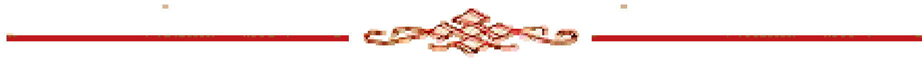
Coming to the final conclusion regarding the RV purohita, we should say the following.

1. Priestly indications are the dominant among all the ones regarding purohita. They testifies purohita's connection to both cosmology and human rituals and rites. And this is what is totally accepted among the scholars. However, those qualities are not the only ones.

2. The indications connected to the military functions are not so numerous as the priestly ones, but they are not so unique and accidental. And this is the main result of the present research:

purohita of the RV society wasn't of the priesthood (brahmaNa) exclusively, but also undoubtedly belonged to the military social strata (future kSatriya).

3. Other characteristics and correlations mentioned, which did not indicate any social specifics, are rare and show usually some general parameters for human being or human society.



Chapter 14 Distortions in the Chronology and Historiography of Bharat's Contributions in Mathematics

Vijay Ashar Ph.D

DISTORTIONS IN THE CHRONOLOGY & HISTORIOGRAPHY OF BHARAT'S CONTRIBUTIONS IN MATHEMATICS

Dr. Vijay Ashar
Presented at HEC 2007 @Dallas, Oct. 12-14

Scope and Topical Outline

- Historiography: Definition
- Pointers for chronology Time Scale
- Comp-chronology : Colonial Vs. Refined
  - A: Ancient (Oral + Taamra-Patra)
  - B: Classical (Source Accessibility)
- Relevant Events/ Cultural Landmarks

Topical Outline: Continued

- Examples of Deliberate Distortions
- Quotes by Non-Indian "Observers"
  - A: Prejudicial Perspectives
  - B: Laudatory Perspectives
- Summary and (Tentative) Conclusions
- Recommend-actions
- REFERENCES

Historiography : Definition.

- "The writing of history based on the **critical examination of sources**, the selection of particulars from **authentic** materials, and the synthesis of particulars which will stand the test of **critical methods**.
- … is much more than "his story or "my story
- In Indian tradition, "history" is "itihaasa" = Iti + ha + aasa : "That's the way it happened".

Time Reference Points to Determine Ancient Chronology

- Kali Era: after 3102 BCE
- Saka-nripa Era: after Saka king Cyrus the Great in 550 BCE
- Vikram Era: by King Vikramaditya (102 BCE 18 AD) in 57 BCE
- Shalivahan Era: started by Shaka King Shalivahan in 78 AD

Notes:
(i) Aryabhatta spoke in reference to Kali Era
(ii) Varahamihira, Brahmagupta and Bhaskara II all spoke in reference to Saka-nripa Era.

Comparative Chronology: Colonial Vs. Refined

A: Ancient Oral Tradition Period:

	Authorship	Colonial Dates	Granthas	Refined Dates
1.	Sage Lagadha	@ 1200-1400 BCE	**Vedanga Jyotisha**	??
2.	(i) Baudhayana (ii) Apastamba (iii) Katyayana	@ 800 BCE @ 600 BCE @ 500 BCE	**Sulva Sutras** (**Kalpa Vedanga**)	3200 BCE

[Contr.: Measures of Time; Maths. of Planetary movements]

[Contr.: Pythagorean Theorem and refinements; Approx. for Surds; Pi 3.088...]

Comparative Chronology: Colonial Vs. Refined – Continued.

- 3. PaNini @ 520-460 BCE **Ashtaadhyaayi** ??

  [Contr. * Formalized Sanskrit grammar and syntax w th about 4,000 Sutras
  * Made Sanskrit the most computer-friendly human language (**OOL**)
  * Ensured pristine purity of Sanskrit to the present day (> 2500 years)]

- 4. Pingala @ 200 BCE **Chhandas-Shaastra** ??

  [Contr. * Elaborated and applied **Binomial Expansion** to 4th order (a + b) * 4
  * Created Science of **Prosody** (metrical composition of verses)]

Comparative Chronology.. Contd.

- **B: Classical Period:**

1.	Aryabhatta I	476 550 AD	**Aryabhattiyam** (120 verses) **Aryabhatta Siddhanta**	2765-2691 BCE
2.	Varahamihira (Vikramaditya Court)	505 587 AD	**Panch Siddhantika** **Brihat Samhita**	123 BCE
3	Bhaskara I	600- 680 AD	**Aryabhatiya Bhasya** **Maha Bhaskariyam** **Laghu Bhaskariyam**	< 200 BCE

Comparative Chronology Contd.

- 4. Brahmagupta 598-668 AD **Brahma-Sphuta Siddhanta (628 AD)** 30 BCE (DOB)

  [Contr. : * Kuttaka Method; Newton-Gauss type Interpolation
  * Solution of N.x*2 + 1 y*2 (Pell's Eqn.- @ 1650 AD)
  * Implicit observation of Newton's LoG
  * Geometry of cyclic quadrilaterals (result of W. Snell 1619 AD)
  * BSS translated in Arabic (Sind-Hind) in 8th century AD

- 5. Mahavira (Jain) 815-878 AD **Ganita Saara-Sangraha** Same

  [Contr. : Garland Products; operations w/Fractions; solutions of Quadratic Equations; Permutations/Combinations; nCr formula (Herrejoni 1634 AD; geometry of Right-triangles, etc.]

Comparative Chronology. Contd.

- 6. Bhaskaracharya (Bhaskara II) 1114-1185 AD **Lilavati; Beeja-GaNitam; Siddhanta ShiromaNi** 486 AD*

[Contr. : * With **Lilavati**, made maths attractive and poetic
* Improved Brahmagupta's solution with **Chakravala** method.
* Introduced the concepts of **Differential and Integral Calculus.**

Note: *He explicitly stated the date of compilation of S/S in ref. to Saka-nripa Era (1036 Saka Kala)

CHRONOLOGY OF Other Prime Events/Personages

- Sage Veda Vyasa: 3374 BCE
  - * Compiled The Vedas, Upanishads, Vedangas, Mahabharata, PuraNas (including Bhagavatam), etc. prior to the start of Kaliyuga in 3102 BCE.
  - * All these Granthas (except a portion of the Vedas) were composed in pristine Sanskrit.
- Gautama Buddha's Era: 1887- 1807 BCE (**NOT** 563-483 BCE)
- Chandragupta Maurya (Coronation) 1554 BCE
  - * groomed/mentored by ChaNakya (**NOT** 321 BCE)

Prime Events/Personages contd.

- Ashoka Maurya (Coronation) 1472 BCE (Grandson of Chandragupta Maurya) (**NOT** 273-232 BCE)
- Adi Shankaracharya 509- 477 BCE (**NOT** 820 788 AD)
- King Vikramaditya 102 BCE-18 AD (celebrated for Nine 'jewels' in his royal court)
- Chandragupta of **Gupta** Dynasty) 327 BCE
- (Coronation)

12/15/2007

Some Examples of Deliberate Distortions of Chronology

1. Vintage of Aryabhatta & Aryabhattiyam (ABM)

   * Original quote from ABM, verse 10:
   " ShashtyAbdAnAm shadbhiH yadA vyatEtAH Trayashcha yugapadAH"
   Distortion: ShashtyAbdAnAm ShadbhiH (60 x 6 = 360 years) was purportedly changed to "ShashtyAbdAnAm shashtiH (60x60)
2. Replace Chandragupta (Gupta) with Chandragupta (Maurya) : (gap of 1200+ years)
3. Deliberate confusion of dates between Shakanripa Era (550 BCE) and Shalivahan Era (78 AD)

Quotes By Non-Indian "Observers"

(A): Prejudicial Perspectives:

1. Max Mueller: (In a Letter to his wife: Oxford, 12/9/1867) " .....This Rig Veda edition (translated by me)..... Is the root of their religion, and to show them what that root is, is the only way of up-rooting all that has sprung from it during the last 3,000 years.
2. Thomas Macaulay (1800-1859) .....set out to revamp the traditional education system and Anglicize it, so that " it will produce such a group of people who would be Indian in blood and color only, but English in taste, opinion and intellect".

Quotes By Non-Indian "Observers".. Contd.

(A): Prejudicial Perspectives:

3. John Bentley: (In *Hindu Astronomy, 1970*) The ancient astronomical literature of India is a mass of **forgeries**, framed for the purpose of deceiving the world with respect to the antiquity of Hindu people"
4. G. R. Kaye (1915): ... It is natural that western investigators into the history of knowledge should seek for traces of Greek influence in **later** manifestations of art and mathematics in particular.

Quotes By Non-Indian "Observers".. Contd.

(B): Laudatory Perspectives:

1. India was China's teacher in trigonometry, quadratic equations, grammar, phonetics.....
   Lin Yutang, Chinese scholar
2. "We owe a lot to the Indians who taught us how to count, without which no worthwhile scientific discovery could have been possible"
   Albert Einstein

Quotes By Non-Indian "Observers"- Contd.

3. " I have traveled across the length and breadth of India and I have not seen one person who is a beggar, who is a thief. Such wealth I have seen in this country, such high moral values, people of such calibre, that I do not think we would ever conquer this country, unless we break the very backbone of this nation, which is her spirtual and cultural heritage……."

   Lord Macaulay's speech to British Parliament

Summary and Conclusions

- A continuity of mathematical tradition in Bharat since before 3000 BCE
- Several prominent mathematical 'texts existed (in Sanskrit) in pre-Christian era
- Pythagoras theorem and its converse was known and applied (thru Sulva Sutras) more than a thousand years before Pythagoras.
- Trigonometry (TrikoNa-miti) became an active discipline since the time of Surya Siddhanta, created in very early BCE.



Chapter 15 Need to Correlate and Rationalize Alexandrian, Roman, Sassanian and Indic Chronology

Muralidhar H. Pahoja PhD

William Jones was the first British writer who suggested the identification of Sandracottus of the Alexandrian narratives with Chandragupta of the Maurya dynasty. This suggestion was later used by Max Müller[1] who declared this synchronism as the 'Sheet Anchor of Indian History'. As a corollary of this synchronism, the chronology of both Buddha and Mahavir had to be advanced by sixty years. The Buddhist and Jain sources concur on the chronology of the Mauryas. How can both be wrong is a question not answered either by William Jones or Max Müller. Alexander's death was taken to have taken place in 323 BCE (2778 Kali). Indian historians, notably Kota Venkatachelam[2] and Bhagavaddatta[3] challenged this chronology and argued that the chronology of the Puranas differs widely from this synchronism. Bhagvaddatta further argued that Alexander's chronology itself needs to be ascertained first, as there are wide gaps between the Greek accounts on the one hand and the Iranian, Etheopic, Arabic, Jewish and Indian accounts on the other. Bhagvaddatta cites Masudi, a tenth century Muslim writer as quoted by Ernst Herzfeld[4], "The Persians and other nations are at variance regarding the chronology of Alexander, a fact many people forget". It is therefore, necessary to examine the different accounts to see what the differences are and if they are reconcilable.

The Greek Account

No contemporary Greek account is available. The earliest writer whose account is available is Diodorus of Sicily (60 B.C.E) Other accounts of Alexander are from Justin, a third century Roman historian, Plutarch of Boeotia (ca 100 CE), Arrian of Nicomedia (2nd century CE), and Curtius Rufus, another Roman historian (1st century). These narratives are summarized by Majumdar[5] and McCrindle[6]. It is to be noted that these so called "Greek" writers do not really belong to Greece but are from various other countries. Some of these writers write in a dialect called Attic (others write in Latin) and on that basis they are called 'Greek'. But even this dialect was of Greek origin is not certain. This dialect is variously described as belonging to Athens, Ionia, Hellenic world and so on. The pronunciation is uncertain. For the New Testament written in Attic Greek, the Harper's Bible Dictionary says "The exact pronunciation of Ancient Greek sounds is no longer known".[7]

These accounts were written between 300 to 500 years after Alexander. They differ much from one another in details[5] and are mostly biased, favouring Alexander. For all of these reasons their veracity is suspect. As for chronology, none of these accounts uses any era to describe the events. Western writers make much of Greek and Roman sense of history and also make tall claims about Greek astronomical knowledge and the era of Seleucus established in 312 BCE But on the ground there is no evidence of either a critical history or of any use of an era, as is amply clear from all of the above accounts of Alexander. None of these accounts even specifies the time gap between Alexander and the writer. But Arrian[8] does use a very primitive tribal system of reckoning which was prevalent in Greece and Rome. This is naming of the archonship or magistracy to specify the year. For example, Arrian[8] specifies some dates, Philip's death occurred when Pythodemus was Archon of Athens; Darius died when Aristophon was Archon at Athens, battle of Porus and Alexander took place during the Archonship of Hegemon at Athens; Alexander's death took place when Hegesias was Archon at Athens. It is a mystery how these "dates" were converted to the Common Era. Western historians place Alexander's reign between 336 and 323 BCE But it is not clear how these dates can be inferred from "Greek" or "Roman" accounts.

The Persian Account

Two major sources of the story of Alexander in Persian literature are (1) Sikandarnama-e-bara of Nizami[9], and (2) Shahnama of Firdausi[10]. Here again it is to be noted, as in the "Greek" account, that neither Nizami nor Firdausi use any dates or any era. We cannot therefore, derive exact dates from these accounts. But Firdausi's Shahnama being a story of kings and dynasties, furnishes us with some indications of the relative placement of kings in time. This information is crucial in determining the relative chronology for example, of Alexander and Ardeshir of the

Sassanian dynasty. After Sikandar's death, Firdausi relates the history of the dynasty of the Ashkaris or Ashkanis, which he says, endured roughly 200 years. They are called miscellaneous kings or kings of the tribes from not being all of the same race, but derive their name from Ashk, the first of them. Eight names of these miscellaneous kings are recounted, which gives an average of 25 years per reign. Western historians place Ardeshir in 224 CE By Firdausi's account, 200 years before Ardeshir would work out to roughly 24 CE (3125Kali) for Alexander. Western accounts place Alexander in 336 to 323 BCE There is thus, a difference of roughly 350 years between the Western and Persian accounts. The results obtained from the Persian account find support from Indian sources as well, as we shall see presently.

The obvious question that arises is how have the Western historians worked out the chronology of Ardeshir and how do they fill the gap between Alexander and Ardeshir which according to them works out to 550 years. The Western historians insert an Arsacid dynasty of Parthia between the years 248 BCE. and 224 CE a period of 472 years. From 323 BCE to 248 BCE for a period of 75 years Iran is placed under Seleucid rule. There is no mention of the Ashkanis in the Western accounts. The Persian accounts on the other hand, do not mention either Seleucid or Parthian rule in Iran. On the face of it, the Shahnama of Firdausi appears to be on firmer ground and does not betray any signs of confusion or deliberate distortion, whereas the Western accounts appear to be confused with regard to Parthian dynasties. Besides, the Western methods of dating are ambiguous as we have noticed above.

How should we reconcile this new chronology for Alexander with the established (!) Roman chronology is another question that arises. The answer is found in a similar anomaly in the Roman chronology itself as we shall see shortly.

There is one other important difference between the Greek and the Persian accounts which we must take note of. This relates to Alexandrian geography. While the Greek accounts speak of a Macedonian Alexander, the Persian accounts (and other Eastern sources) call him 'Rumi'. This Rum is neither Greece nor Rome. It is located in central Anatolia (Turkey) and western Syria. The well known Sufi Saint Jalaluddin Rumi belonged to Rum. The capital of Rum as mentioned in Shahnama was 'Amuria'. Thus, as per Firdausi (and all Eastern sources), Alexander was not a European at all, but belonged to Rum in Anatolia. The prefix 'Al' in Alexander's name itself points to a middle eastern origin.

'Greece' as a name of a country never occurs in Eastern accounts. 'Yunan' of Eastern accounts is translated as 'Greece'. It is not clear why in the Eastern accounts the name 'Greece' is not used if that is what is meant by 'Yunan'. This identification of 'Yunan' with 'Greece' raises suspicion and needs investigation.

The Indian Sources

There are available a number of notices of Alexander's invasion in Indian literature. Since our main interest relates to chronology, we shall deal with one source that furnishes us with a date. James Tod[11] in his treatment of 'Annals of Jaisalmer', relates the story about Sikandar Rumi attacking the fort of Ghazni which belonged to Raja Gaja Singh Bhatti. This Ghazni is not the well known place of that name in Afghanistan, but it appears from the narrative that it was on the sea shore. The attack was repulsed and the Shah Sikandar Rumi and his army fled. Raja Gaja Singh married a princess from Kashmir who bore him a son named Salbhan. When Salbhan was 12 years of age, Shah Sikandar Rumi attacked again and this time was successful in capturing Gazni and Raja Gaja Singh was killed.

The above narrative is strikingly similar to that of Alexander's capture of Gaza which was defended by one Batis

(Bhatti?) who along with his men fought to the last. Batis was captured and tortured to death. The Greek accounts do state that Alexander was beaten back thrice before in the fourth attempt he was successful. There is no mention of a thirteen years gap, but other details are strikingly similar. Gaza is placed by Western historians on the eastern shores of the Mediterranean. But as pointed out above, the geographical data of the Greek accounts needs to be re-evaluated.

Tod's narrative adds that Prince Salbhan was on a pilgrimage to Jwalamukhi at the time. When the tidings of the fatal event reached him, he at length reached the Punjab where he laid the foundation of a city which he named Salbhanpur (Shalikot or Sialkot). This was on the 8th of Bhadrapad, Samvat 72, corresponding to Kali 3116. This date would place Sikandar Rumi roughly in 15 CE. which agrees closely with 24 CE derived from the Persian account.

This chronology finds support from the Skanda Purana[12], which states,

ततः त्रिषु सहस्रेषु शतेनापि अधिकेषु च।

शकोनाम भविष्यश्च सोऽति दारिद्र्यहारकः।।

"In the Kali year 3100 (1 BCE), a tyrant by name Shaka will descend". This tyrant is named 'Shaka' i.e. Shakendra or Sikandar. Alberuni[13] describes this Shaka thus, "This Shaka tyrannised over this country between the river Sindh and the ocean….he interdicted the Hindus from considering themselves as anything but shaka….Hindus had much to suffer from him, till at last they received help from the east when Vikramaditya marched against him, put him to flight and killed him in the region of Karur, between Multan and the castle of Luni. This date became famous as people rejoiced in the news of the death of the tyrant , and was used as the epoch of the era of Shaka." This description would place the death of Sikandar in Kali 3179 (78 CE).

Roman Chronology

As in the case of Greek chronology, the Roman chronology also is devoid of any real historical basis. There is no archaeoligical, literary or numismatic evidence, to support the established(?) Roman chronology. There are glaring discrepancies between what is claimed and what is seen on the ground. For example it is said that Augustus established a new era from 28 B.C.E., but there are no inscriptions or documents extant using this era. The Roman coins are not dated. Thus there is no evidence of any era being used. Roman historians, too ,do not use any era. One reason for this could be the cumbersome Roman numeral system. To overcome this difficulty, by the late fourth century documents were being dated according to a 15-year cycle of the induction. Regnal year of the Emperor was also used. As in the case of Greek historians, Romans too used the primitive method of dating by naming the year after the Consul currently in office. For example it is said that Augustus was born during the consulate of M.Tullius Cicero and this year is mysteriously equated to 63 BCE. It is said that 'Fasti Capitilini' an inscription containing an official list of the consuls was published by Augustus, using an epoch of 752 BCE. for founding of Rome. But such a back calculation can be made only if Augustus' own time is known with certainty.

Dates of Roman emperors from Muslim sources are at variance with Western dates. For example, the Ain-e-

Akbari[14] dates Diocletian in 585 CE while the Western date is 284/85 CE, a difference of 300 years.

Chronology of Jesus Christ

The use of the Christian calendar did not begin in 1 CE. In fact the epoch was fixed by Dionysius Exiguus in 525 CE The Christian **Era** did not become general in Europe until the 11th century. The length of the year was taken as 365 ¼ days. In 1582 Pope Gregory ordered a reform[82] of the calendar adopting the year of length 365.2425 which closely approximates the tropical year of 365.2422 days. In the new calendar a century year was not a leap year unless divisible by 400. Thus, years 100, 200, 300 were not taken as leap years. To correct the accumulated error till 1582, 10 days were dropped. This figure of ten days is telling. If the correction was to be made from 1 CE, then 15 century years would have occurred out of which only three (400, 800, 1200) would be leap years. The correction therefore, should have been of 12 days. Why were only 10 days dropped? Some have tried to argue that the correction was made from the date of the first council of Nicaea (325 CE). But this argument is not convincing. For the Church, Date of Christ's birth would be of prime importance and the reckoning ought to begin from that date. Besides between 325 and 1582 there are 12 century years out of which three would be leap years, the correction therefore, should have been of nine days. Since the correction made was of ten days, the base year was in the third century. It is significant that earlier, the Church used an epoch from 282 CE and it seems most likely that the correction was made from this year. This is also evident from the fact that the year of correction was 1582 exactly 1300 years from the epoch. It would be therefore, reasonable to conclude that, since the year of Christ's birth was of prime importance to the Church, this year 282 was in fact that year.

Conclusion

In all the three cases discussed above, the Greek, the Roman, and the Christian chronology, there appears to be a uniform error of roughly three hundred years. There is evidence that suggests that the year of Christ's birth was 282 A.C.E. The Western chronology therefore, needs to be adjusted accordingly.

References

- Max Müller F., History of Ancient Sanskrit Literature, Allahabad 1859.

---

[82] We will refer to this again in the appendix in the section on the Calendar. It turns out that the Gregorian calendat was fixed shortly after Jesuit Matteo Ricci , who was deputed by Christopher Clavius of the college of Rome reported on his findings on Jyotisa from Malabar, whete he went in his own words to learn from the Brahmanas

- Kota Venkatachalam P., Chronology of Ancient Hindu History, Pt. 1, Vijayawada, 1957.
- भगवद्दत्तए भारतवर्ष का बृहद् इतिहास, भाग १, पृ. २९९-३००, देहली, सं २००८.
- Herzfeld, Ernst., Zoraster and His World, 1947, p.13.
- Majumdar, R.C., The Classical Accounts of India, Calcutta, 1981.
- McCrindle, J.W., The Invasion of India by Alexander the Great, Patna, 1989.
- Achtemeier, P.J. (Ed), Harper's Bible Dictionary, p360,Bangalore, 1990.
- Chinnock, E.J. (Tr), The Anabasis of Alexander, Dehradun, 1977.
- Clark, H.W. (Tr), The Sikandar Nama E Bara, New Delhi, 1979.
- Levy, R. (Tr), The Epic of the Kings- Shah Nama of Firdausi, London, 1967.
- Tod, James., Annals and Antiquities of Rajasthan V2, p175-77, New Delhi., 1978.
- Skanda Purana 1/2/40/54.
- Sachau, E.C. (Ed), Alberuni's India, vol II, p6-7, Delhi, 1993.
- Blochmann, H. (Tr), The A-In-I Akbari, Vol. II, p25, Delhi, 1989.

\


Chapter 16 Negating the Colonial Construct of Oriental Despotism: The Science of Statecraft in Ancient India

Om Prakash Misra

The country which lies to the south of the Himalayas and the north of the oceans is called Bharata and the Bharateeya are the people of this country.

Vishnu Purana, Ch. 3, p.1

Abstract

The colonial rulers in India manufactured several myths in order to impose ideological hegemony on the Indian mind. Some of these theories were the notions of the White Man's Burden, Oriental Despotism, Theory of Guardianship, Civilizing Mission etc.

This paper attempts to focus on one of such aspect i.e., Oriental Despotism. This theory says that Indians were always ruled by the despots and tyrants since ages and so they are fit to be ruled with an iron hand and such uncivilized Indians need to be civilized by a superior race of the whites.

Related to the above concept the British thesis was that there was no statecraft in ancient India and rulers always brutally exploited the people. However such myth got a severe jolt in the first decade of 20th century when Arthasastra of Kautilya was discovered by R Shyam Sastry and other historical researches took place with the help of some of the Orientalists. One of them was discovery of 5000 year old Indus Valley Civilization by Dayaram Sahni and Marshall.

This paper has aimed is to discuss about a well developed science of statecraft in ancient India. The Saptanga theory of State of Kautilya, the Organic theory of state, the idea of a welfare state and a republican state has attracted considerable research by the various academicians since last several decades. So another aim of this paper is to focus some new light in the back drop of existing historiographical debate on the said subject and to project true image of India's past in the area mentioned.

Introduction

The Indian historiography was dominated by the Cambridge school of thought till India's independence in 1947. This school negated Indianess, Indian nationalism, Indian nation, Indian culture and Indian people. They even refused to accept that

there was an Indian freedom struggle against the British colonialism and exploitation. The rise of the nationalist school spearheaded by nationalist leaders was a reaction against such reactionary approach of Cambridge school. They glorified India's past and sought to protect the Indian culture and tradition from the British colonizers and missionaries onslaught. However the objectivity in the historiography remained aloof. The Marxist school made an attempt to fill the gap by bringing the objectivity at the fore but it had its own inherent ideological limitations.

Despite sixty years of independence, India has yet to negate several Euro-centric biases in the historiography. Terming Samudragupta as Napoleon of India is one of such example, which is totally unjust. Napoleon met his waterloo, Samudragupta never got defeated in the several battles he fought. Like wise calling Kalidas as Shakespeare of India is ridiculous. Both Shakespeare and Kalidas were great dramatist but Kalidas is known also as a great nature poet. Why Shakespeare should not be termed as Kalidas of England? This is strange that since 5000 years invaders who came to India got overwhelmed by the superior Indian civilization and culture and ultimately got assimilated in the Indian society and culture. Their identity merged in that larger identity of Aryavrata, Bharat. But the British colonizers denigrated Indian culture, mocked Indian religion and mythology and remained aloof from the Indian society.

Main objective of this paper is to refute such euro-centric bias regarding statecraft in Ancient India. Another objective of this paper is to portray the real aspects of the state system in Ancient India. Since science of statecraft includes a large number of elements for example, judicial system, bureaucracy, army, civil institutions etc, it won't be just to give a detailed account of all these aspects in one paper. So primarily the main focus of this paper is to discuss about the idea and types of government in ancient India in the light of various theory of state and *Rajdharma* or duties of the king as prescribed by the lawgivers with an attempt to portray that how well developed were the rules of governance.

The Origin of the Colonial Ideological Hegemony

The theory of Oriental Despotism was a western construct and especially a reflection of the colonial mindset. Some of the leading propounders of this theory were James Mill, John Kaye, Montesquieu, Hegel etc. The focus of this theory is on India and China, the two major civilization of the Orient. There were specific comments on India like, "unchanging stagnant India", practice of the same religion and customs since ages and the despots and tyrants who ruled Indians since ages and the uncivilized Indians who are fit to be ruled with an iron hand.[83] It was held that there is no change in Indian custom, laws and manners because Indians are indolent in both body and mind and hence prone to inaction.[84] Such ideological constructs were created to derive the legitimacy to impose tyrannical rule on India.

The British administrator historians or the Anglicists as they were called, developed related theory of "Civilizing Mission", "White Man's Burden", "Theory of Guardianship" etc. to impose an ideological hegemony on the Indian mind. It has been

---

83 Hegel talked about unchanging India and their unbroken superstitions. Hegel, *The Philosophy of History*, Tr. J Sibree, New York, 1949, pp. 154, 167.

84 Montesquieu, *The Spirit of Laws*, The Hafner, New York, 1949, pp. 224-25.

observed that the theory of oriental despotism is being resurrected in the recent times by adding the flavor of religion in it.[85] To give credibility to this construct there was depiction of Indian thought as symbolic and mythical rather than rational and logical. Anglicists argued that western knowledge in English should displace the Eastern. James Mill's *History of India* was, in large part, written as a refutation of some of William Jones's ideas, which ultimately shaped the policies of the East India Company.[86]

While commenting on the legitimate and inevitable European dominance, Hegel says: "The English, or rather the East India Company, are the lords of the land; for it is the necessary fate of Asiatic Empires to be subjected to Europeans; and China will, some day or other, be obliged to submit to this fate."[87] Peter Marshall commenting on such European construct says: "As Europeans have always tended to do, they created Hinduism in their own image. Their study of Hinduism confirmed their beliefs, and Hindus emerged from their work as adhering to something akin to undogmatic Protestantism. Later generations of Europeans, interested themselves in mysticism were able to portray the Hindus as mystics."[88]

Attacking on such colonial construct a French Orientalist Anquetil Duperron writes, "Despotism is the government in the countries, where the sovereign declares himself the proprietors of all the goods of his subject: let us become that sovereign and we will be the master of all the lands of Hindustan. Such is the reasoning of avid greed, concealed behind a façade of pretext which must be demolished."[89]

Max Müller has quoted Warren Hastings about the character of the Hindus. Hastings says, "The Hindus are gentle and benevolent, more susceptible of gratitude for kindness shown them, and less prompted to vengeance for wrongs inflicted than any people on the face of the earth; faithful, affectionate, submissive to legal authority."[90] So India remained the epicenter of research due to having certain vested motives or otherwise.

---

85 Ram Sharan Sharma, *Aspects of Political Ideas and Institutions in Ancient India,* Motilal Banarasidas, Delhi, 2001, p. 86.

86 Sir William Jones was a leading orientalist and had a great respect for Indian culture and civilization. He established the Asiatic Society of Bengal in 1784 for historical research and to dig out the glorious past of India. Due to such efforts he became the subject of criticism by the Anglicists.

87 Hegel, *Philosophy of History*, pp. 142-3**.**

88 Peter Marshall, *The British Discovery of Hinduism in the Eighteenth Century,* Cambridge: Cambridge University Press, I 970, pp. 43-44.

89 Perry Anderson, *Lineages of the Absolutist State*, New Left Books, Verso, London, 1974, pp. 465-466.

90 F Max Muller, *India: What Can it Teach us*, Penguin, New Delhi, 2000, p. 56.

Statecraft in Ancient India

In Vedic times king's authority was substantially limited by the tribal assemblies, Sabha and Samiti. Sabha was a council of elders. According to Jayaswal, Sabha was a national judicature, which exercised judicial functions by a standing committee.[91] Samiti was a more comprehensive conference including common people, priests and nobles. It was a folk assembly in which people of the tribe gathered for transacting tribal business and it was presided over by the king. Samiti acted as a gathering of the scholars for intellectual discussions and was also concerned with religious ceremonies and prayers. The most important political function of the Samiti was to elect and re-elect the king. The Samiti was a great deliberative body and it carried an active discussion to achieve concord, which proves that there was an argumentative tradition.

The third popular assembly of the Vedic period was Vidatha. It was the earliest folk assembly of the Indo-Aryans. The factor, which distinguishes Vidatha from Sabha and Samiti, was participation of the women in it. In the debate women enjoyed parity with men. One of the major functions of Vidatha was distribution of produces. So although the Vedic society was egalitarian, the polity was a tribal one.

The Idea of a Republican government

Republican polities were most common during the Buddhist period, 600 B.C.-A.D. 200. At this time, India was in the process of urbanization. Power in some republics was vested in a large number of individuals. The Pali Canon gives a picturesque description of the city of Vaishali in the fifth century B.C. as possessing 7707 storied buildijgs, 7707 pinnacled buildings, 7707 parks and lotus ponds, and a multitude of people.[92]

Pali, Sanskrit, Buddhist and Brahmanical literature, shows that non-monarchical forms of government were omnipresent.[93] In the northwestern part of India, republicanism was the norm. Alexander's historians mention a large number of republics.[94] Panini (fifth century B.C.) mentions about the process of corporate decision-making. He discuss about voting

---

91 K P Jayaswal, *The Hindu Polity*, Butterworth, Calcutta, 1924, p. 18.

92 Narendra Wagle, *Society at the Time of the Buddha,* Bombay, 1966, pp. 27-28

93 V.S. Agrawala, *India as Known to Panini: A study of the cultural material in the Ashatadhyayi*, 2nd edn. rev. and enl., Varanasi, 1963, pp. 426-444.

94 Altekar, *State and Government in Ancient India*, Motilal Banarasidas, New Delhi, p. 111

process and decisions reached by voting, and the completion of a quorum. The division of assemblies into political parties was well known. Further, Panini and his commentators show that sometimes a smaller select group within a *sangha* had special functions -- acting as an executive or perhaps as a committee for defined purposes.[95]

The tradition in the Buddhist *sangha* reflects a sophisticated and widespread political culture based on the popular assembly.[96] "Government by discussion" continued within many *ganas* and *sanghas.* So a country with widespread republicanism was thought to be the home *par excellence* of "Oriental Despotism."[97] Indian republics of the sixth centuries B.C. had long passed the tribal stage of society. They were states, *Ganas* and *Samghas*, though many of them likely had a national or tribal basis, as every state, ancient or modern, must necessarily have.[98] The existence of Indian republicanism is a discovery of the twentieth century.

The word Gana has been referred as government ruled by assembly. It seems that in Vedic literature this term is used in the sense of tribal or clan solidarity. The Rig Vedic gana were very different from the post vedic gana. Rig vedic gana were armed organization and had a military character. These tribal republics were hostile to each other and were in constant warfare with each other. The post-vedic ganas are described as settled on the fixed territory, but the Rigveda gana were in a nomadic and migratory state.

The Idea of a Oligarchic System

The post-vedic republics mainly originated due to, firstly, the buddhism and jainism religious movement of 6th century bc. it challenged and gave blow to the caste, class and sex discrimination which was creating hierarchy ajd a vertical division in the society. they also successfully revolted against the abominable rituals involving destruction of cattle wealth, which was so important for the agricultural economy. secondly, the leaders of the reformation movement condemned the hereditary kingship based on brahmanical ideology and the discrimination faced by the masses. they took paradigm from

---

95 V.S. Agrawala, Ibid, pp. 433-35.

96 R.C. Majumdar, *Corporate Life in Ancient India*, Firma, Calcutta, 1969, pp. 233-34.

97 Romila Thapar, *History of India*, Harmondsworth, 1966, p.19

98 Jayaswal, *Hindu Polity*, Ibid., p. 46.

the past tribal homogeneity when there was no varna distinctions, non-domination of the priestly and military class over the tribal masses and a semi-egalitarian classless and casteless society based on equal distribution of surplus, and dignity and equality of human being was recognized.

The transformation of some republic state into oligarchies is also evidenced; however the real causes are not very clear. it seems that in the early vedic age clan chiefs obtained a portion of the booty and tributes collected from the non-aryans. but when head of the victorious clan had a sedentic pattern of living this chief turn into gentry and claimed all revenues from the peasants. this marginalized and denigrated the position of the other clan members. they reacted against such injustice and an intra-clan conflict emerged and this give way to the oligarchical system of polity in which a stratified patriarchal society, bureaucracy, taxation system and an army for the coercion of the people remained.

according to james mill, when we look for the particulars of those pretended reigns of mighty kings under whom science flourished, and civilization rose to the greatest height, we meet with nothing but fable.[99] he further says, “if despotism and priestcraft taken together, the hindus, in mind and body, were the most enslaved portion of the human race”.[100]

Saptanga Theory of State

The work, which discusses in detail the science of statecraft, is Arthashastra of Kautilya. It gives detailed account about the mechanism to control the state, organization of the national economy and the conduct of the war. The Artha-sastra, refers to the seven limbs of the state: Swami (King); Amatya(Bureaucrats); Janapada (territory); Durga (Fort); Kosa (treasure); Danda(coercive authority); Mitra(ally).

Kautilya (c. 300 b.c.) prescribes the king a more independent role and emphasized his responsibility for peace, justice and stability.[101] another element amatya(bureaucrats) were the officer cadre to run administration. a large number of bureaucrats were designed to dispense the public affairs. the most

---

99 James Mill, *The History of India*, Vol VII, p. 107.

100 Ibid.

101 *Kautilya's Arthasastra*, trans. by R. Shamasastry, 4th ed., Mysore, 1951; first ed. 1915.

important amongst were the amatyas(departmental head), mantrins or the ministers. the king consulted these ministers in formulation of decisions. they were summoned along with the mantri parisad in emergency. this parisad or assembly, which consisted of mantrins and amatyas, was like a parliament and advised the king in maters of war and peace. but the king was not bound by their advice.

Janapada (territory) comprise both population and territory. It should possess a number of characteristics, like having a good climate, having grazable and fertile lands, industrious peasants, loyal people etc.[102] Durga or fort contains the capital of the kingdom. Kosa (treasure) were formed due to taxation by legitimate means. Danda(coercive authority) includes Army having four category of soldiers i.e., hereditary, hired, forest, corporation soldier. It had four limbs i.e., infantry, chariots, cavalry and elephant. Mitra (ally) could be hereditary, should be ready to come for help and also should be trust worthy.[103]

Saptanga theory was the creation of the Brahmanical school of thought. It covers all the four element of the modern definition of state. It consist the element of recognition in form of ally. These seven elements are more obvious and manifested compared to modern definition.

Contract Theory of State in India

The earliest brahmanical exposition of the contract theory of the origin of the state in clear terms occurs in the *Arthasastra* of Kautilya. This theory is propounded incidentally in connection with the refutation of the brahmana's claim to social supremacy. It states that overtaken by a state of anarchy the people elected Manu Vaivasvata as their king and undertook to pay 1/6 of their grain, and 1/10 of their articles. In return for taxes the king guaranteed social welfare to the people by taking to suppress acts of mischief, afflicting the guilty with coercion. Even the inhabitants of the forest were required to give him 1/6 of the forest produce.[104] This account of the origin of the state closes with the moral that the king who assures security and well-being to his subjects by eliminating wrongful acts through coercion and taxes, should not be disregarded.

Santi Parva of Mahabharata embodies theories of both social and political contract. It is stated that in ancient days when anarchy was rampant, people made an agreement among themselves. They undertook to abandon one who speaks much, is cruel in acts, encroaches on other's property, and violates woman's chastity. Clearly this was a social agreement to maintain the institutions of family and property.

102 Ibid.

103 Ibid.

104 Kautilya, *Arthsastra*, Ibid, p. 22.

The important element common to the two theories in the *Santi Parva* is the fact that none of them, unlike the Buddhist theory, refers to the election of the king. On the contrary, they ascribe the origin of kingship to divine agencies such as Vishnu and Brahma. Thus the element of election, which is noticeable in the Brahmanas and Kautilya, is eliminated in the *Santi Parva.*

The first clear and developed exposition of contract theory is found in the Buddhist canonical text *Digha Nikaya,* where the story of creation reminds us of the ideal state of Rousseau followed by the state of nature as depicted by Hobbes.

It is said that there was a time when people were perfect, and lived in a state of happiness and tranquility. This perfect state lasted for ages, but at last the pristine purity declined, heavenly life degenerated into earthly life. Now shelter, food and drink were required. People gradually entered into a series of agreements among themselves and set up the institutions of the family and property. But this gave rise to a new set of problems, for there appeared theft and other forms of unsocial conduct. Therefore, people assembled and agreed to choose a leader who could guarantee their life and property. In return they agreed to contribute to him a portion of their paddy.

In contrast to several obligations of the king, the people are assigned only one duty, namely, to pay a part of their paddy as contribution to the king. The rate of taxation is not prescribed, but the law-book of Baudhayana lays down that the king should protect the people in return for one-sixth of the produce. Thus the idea of protection in lieu of taxation was current in the brahmanical circles of pre-Maurya times also. Payments of taxes were made obligatory on the people with the beginning of the Post-Vedic period.

The only limitation proposed on the power of the ruler in the Buddhist theory of contract is that he should act according to the Norm or *dharma,* but this does not directly form part of the contract theory. At one place it is stated that the *raja* pleases the people in accordance with *dharma.* Thus the origin of the ruling oligarchy took place according to dharma*,* justice or righteousness.

Rajdharma or Rules of Governance

According to Kautilya, Swami or King being the Sovereign should possess the qualities of being a man of wisdom, should be unselfish, protective to the people, should initiate welfare work for the people, should protect the people from internal and external aggression etc.[105] According to Kautilya, for a king his religious vow(vrata) is constant activity in the cause of his people; his best religious ceremony is the work of administration; his highest charity is equality of treatment meted out to all. In laying down principles of king's virtues, Kautilya emphasizes 'abundance of enthusiasm and freedom from

105 For detail see R P Kangle, ed and translated, *The Kautilya Arthasastra*, University of Bombay, 1960.

procrastination'.[106] Such exposition of Rajdharma or constitutional law, which prescribes the duties of a king, lays down the basic foundation on which the system of governance was laid down.

Although there was a divine aspect of kingship, but according to P V Kane it does not mean that king had unlimited powers.[107] Refuting the idea of divine kingship K M Pannikar says, "By no strength of imagination can it be interpreted to mean that the king in his own person was Indra, Yama, Dharma. He was to possess the qualities of these three."[108] It seems that not every king were treated God like but those who followed the path of Dharma, righteousness were given some amount of veneration. Manu prescribes for the King that they should learn the science of government, science of dialects and should be truthful.[109]

Further Manu suggest that king should not do anything in haste but should think carefully. He should possess good common sense, and should know the respective values of virtue, pleasure and wealth.[110] Katyayana suggests the king to be humble and cultivate humility.[111] Although all the important law givers has recommended intelligence as an important quality to be possessed by the king, Manu suggests that king should be self sacrificing for the good of the people and should not go by his own likes and dislikes.[112] Further Manu advised the king to refrain from following vices. In the first category Manu puts the vices springing from love of pleasure as follows: hunting, gambling, sleeping during day, curiosity, excessive indulgence in sex, drunkenness, an inordinate love for dancing, singing and music, and useless travel. Further Manu talks about the vices arises from wrath as follows: violence, treachery, envy, slandering, seizure of property, reviling and assault etc.[113] Protection of sovereignty and integrity

---

106 Wagle, Ibid.

107 P V Kane, *History of Dharmasastra*, Vol. III, Bhandarkar Oriental Research Institute, Poona, 1946, pp. 25-26.

108 K M Panikkar, *Origin and Evolution of Kingship*, Asia Publishing House, Bombay, 1938 p.35

109 Edward W Hopkins (ed), *Manusmiriti*, Trubner and co., London, 1884, Vol VII, p. 43.

110 *Manusmriti*, Ibid, p. 31.

111 N C Bandopadhyaya, *Katyayana Matasamgraha*, Calcutta, 1927, pp. 1-2

112 *Manusmriti*, Ibid, Vol VIII, p.133.

113 *Manusmriti*, Ibid, Vol, VII, pp. 45-49.

of the kingdom was a very important duty of the king since on that lies the prosperity of the people. The smriti writers instruct the king to maintain the internal peace of the kingdom. In order to contain bribery and corruption Yajnavalkya prescribes that taker of bribes should be deprived of his wealth and property.[114]

Not only this, there are elaborate rules and regulation for the protection of environment and vegetation as part of the Rajdharma. Manu states that animal and pastoral ground should be protected.[115] Another lawgiver Vishnu has prescribed that king is responsible for protection of the trees yielding fruits and blossoms and those responsible for its cutting should be fined heavily.[116] Yajnavalkya suggests that the king should grow trees at the places of memorial, cremation ground, on boundary lines and holy places.[117] Pollution at public places was a crime. Vishnu held that that if one defiles the highway, a garden or reservoir of water he shall be fined a hundred panas.[118] Even Kautilya has prescribed hefty fine for polluters.

Conclusions

Although the most widespread form of government in Ancient India was monarchy still most of the rulers worked for the betterment of the masses. Mauryan state is a true example of a welfare state. The rulers established a number of canals and dams for the higher production and betterment of people as well the economy of the empire. The Anglicists have unjustly dubbed this phenomenon as hydraulic despotism. The brilliant science of statecraft based upon the rules of governance prescribed by the lawgivers proves that how unfounded are the theory of oriental despotism.



114 *Yajnavalkya*, Vol I, p.339.

115 *Manusmriti*, Vol. VIII, pp. 230-37.

116 Vishnu, Vol V, pp.55-59.

117 Yajnavalkya, Vol II, p.238.

118 Vishnu, Vol V, p. 106

(3651 words)

Chapter 17 Hindu Traditional Knowledge System and Educational Reforms

Swami Vigyananand

Traditional knowledge systems are dying and steps are being taken to

reintroduce, maintain, preserve the traditional knowledge system

and to learn popularize and spread the traditional knowledge

Dying traditional knowledge systems

The Hindu civilization has the longest continuous history, and the oldest amongst the great civilizations of the world. Traditional knowledge systems are a body of knowledge, which are very ancient and deep rooted. They originate in the remote past. From the very beginning of our civilization, all knowledge was in the oral tradition. There was no written text in those days. It was handed over generation to generation through oral tradition based on memorizing hymns, verses and poetry, therefore it was called Shruti. As the centuries rolled by, the Vedas and Vedic literature were written down in prevalent scripts of those days. Subsequently these Vedas, and allied Vedic literature, Shramanic Jain and Boudha, Shaiva, Shakta, and Vaishnav etc, agama based traditions; language, literature, philosophy and the knowledge system were organized in methodical way.

At that stage we can divide traditional knowledge system in two sections - one written thus organized, and the other oral and unorganized. This unorganized traditional knowledge system and technology also incorporated the wisdom distilled through millennia of experimentation of trial and error. These traditional knowledge systems which are essentially the indigenous (Desi) tradition of Indian science, are oral, unsystematic, undocumented. They contained a vast treasure house of knowledge in simple poetry on agriculture, horticulture, soil science, climate, meteorology, mines, minerals, astronomy, hydrology, mathematics, plants and herbs, ayurveda, sports and games, ethics and principles, etc. This undocumented body of knowledge is also a part of the great heritage of humankind, which is under imminent danger of getting lost with the onslaught of western-oriented modern education. This

body of knowledge needs to be preserved and documented and used for benefit of the possessors of such knowledge, their region and humanity at large.

Let us focus on the vastness of organized section of Vedic and Shramanic literature. I am quoting from Vyakaran, Mahabashya, authored by Rishi Patanjali:

"Mahan hi Sabdasyah prayog vishayah, Saptadweepa vasumati, Trayolokah Chatwaro vedah, Sanga Sarahasya Bahudha vibhinnah, Eksatam adhvaryu Sakhah.
Sahasra vartma samvedah Ek vinshatidha Bahva Richyam, Navdha Atharvano Vedah, Vako vakyam Ithihasah, puranam vaidyakam iti Etavat Sabdasya prayog Vishayah."

i.e. The usage of word is spread in seven continents (Saptadweepa) of the Earth and three lokas (Akash, Prithvi and Paathal i.e. everywhere), four Vedas together with Vedang, Brahman, Aranyaka and Upanishads. They are many in types and number. These Vedas are again spread in several and different Shakha, such as Yajurveda has 101 Shakha, Samved has one thousand Shakha, Voluminous Rig Veda has 21 Shakha and Atharva Veda has 9 Shakha, Itihasa, Purana (history), and Ayurveda, etc that the usage of word is so vastly spread.

This ocean of organized traditional knowledge system is divided in Ashtaadasa Vidya (Eighteen Vidyas - Knowledge System):

"Angani Vedah Chatvaro Mimansa Nyaya Vistarah Dharma Saastram Puranam cha Vidya hi Eta Chaturdash. Ayurvedo, Dhanurvedo, Gandharvaveda Cha iti. Arthasastram Chaturthayantu Vidya Ashtadash Smrita"

Angani i.e. Six Vedang - Shiksha, Vyakaran, Nirukta, Kalpa Shastra, Chhanda, and Jyotish

Shiksha - Science and technique of correct pronunciation: The popular Shiksha was by Rishi Panini, which is lost in practice. Several other Shikshas are in use. Therefore we find corruption in pronunciation.

Vyakarana - Sanskrit Grammar: starts from Indra Vyakaran of 1 lakh shlokas authored by Indra (which is completely lost.) Saktayana Vyakaran and several other school of Vyakaran also followed Indra grammar are lost. At the last Indra Grammar School was followed by famous Rishi Panini as in Ashtadhyayi. This Vyakaran is big ocean itself. The scholarship in this school is dying in this independent India.

Nirukta - Vyutpativad of Vedic words (etymological interpretation or explanation of a word; name of a commentary on the Nighantu by Rishi Yaska): The real scholars of Nirukta are really very difficult to find in Bharat.

Kalpa Shastra - Practicable; feasible; proper; fit; a correct precept; law; rule; ordinance prescribed by the Vedas, such as Katyayan Sraut Sutra, etc: This Kalpa Shastra system is very vast. Sulba sutra is part of Kalpa shastra, the origin of mathematics. Learning and practicing tradition of this Kalpa Shastras are dying.

Chhanda Sastra - Metrical science of Veda Mantra: Authored by Rishi Pingal Jyotish - Surya Sidhantha (Astronomy & Mathematics). Aryabhat, Bhaskaracharya, Brahmagupta were great teachers of this school. This is again spread in several types of mathematics and astronomical school of Joytisha Shastra.

The Vedas - Four: Rigveda, Yajurveda, Samveda and Atharvaveda (Every Veda has one Upaveda also)

Vedas	Total Shakha	Lost	Available	State of Scholarship
Rig Veda	21	18	3	Very few
Yajurveda	101	93	8	Sharply declining
Samaveda	1000	995	5	Rare
Atharvaveda	9	4	5	Dying

Rig Veda - **Ayur Veda:** Ayurvedic surgery and famed plastic surgery of Aryurvedic School in Bharat is completely lost. Briksha Ayurveda (Botany), Go Ayurveda (Veterinary Science) is lost. Books on the above subject are also not available in Bharat. Some books are known to be available in foreign libraries.

Yajurveda - Dhanur Veda: Shastra which created experts like Bhagwan Parasuram, Bhagwan Ram, Laxman, Bhishma Pitamaha, Dronacharya, Karna and the famous Arjuna is completely lost today. Even it is very difficult to find it in the archives.

Samveda - Gandharva Veda (Nritya and Sangeet Shastra): As a Veda, Gandharva veda is lost. Bharat Muni Natya Shastra is popular.

Atharva Veda - Artha Veda as a Veda is no more available. Arthshastra of Kautilya (Chanakya) is available. The Silpa shastra is part of Arthveda. The knowledge system of this Silpa shastra is spread in several complete knowledge system like architecture, civil engineering, mechanical engineering, metallurgy and mining, etc.

The construction of Raja Rajeshwara temple at Tanjavore is a mystery. No one knows how such heavy stone reached on top of the temple. No one knows what type of engineering and instruments were used in those days. It is completely lost. Only few sculptors and Sompura families are surviving. Our Rishis were aware of the full consequence of using big and heavy technology and instruments. Therefore they controlled the use of heavy

technology by minimizing to the maximum level.

"Sarvakareshu Adhikari Mahayantra pravartanam

Himshaoushadhinam strayajeevoabhicharo Mulkarama cha"

This quote from the Manu Smriti means - do not use the big technology, it creates exploitation of human being and environment along with unemployment. Use of heavy machine is very harmful for society and nation. In 1950 when Pt. Bhagwaddatt while translating the above shloka commented that "the western world is enjoying by using heavy engineering and technology, the disastrous consequence would be known very shortly to the western world". Now we are watching the consequence. A small portion is shown in a movie **Inconvenient Truth** produced by Mr Al Gore, former Vice President of USA.

Serious Scholarship in Brahmanas and Aranyaka are no longer available. Here is a list of the old, new and lost Brahmana and Aranyakas.

Brahmanas - Old and New (which are available in Granthalayas i.e. libraries)

Brahmanas of the Rigveda: Aitareya Brahmana, Kaushitaki Brahmana, Samkhayana Brahmana.

Brahmanas of the Yajurveda: Madhyandia Satapatha Brahmana, Kanva Satapatha Brahmana, Taittiriya Brahmana of the Krishna Yajurveda.

Brahmanas of the Samaveda: Tamdya Brahmana, Shadvimsa Brahmana, Mantra Brahmana = Chhandogya Brahmana, Daivata or Devatadhyaya Brahmana, Arsheya Brahmana, Samavidhana Brahmana, Samhitopanishad Brahmana, Vamsa Brahmana, Jaiminiya Brahmana, Jaiminiya Arsheya Brahmana, Jaiminiyopanishad Brahmana

Brahmana of Atharvaveda: Gopatha Brahmana

The Lost Brahmanas -

Brahmanas of the Rigveda: Paimgi, Paimgya, Paimgayani Brahmana, Bahvricha Brahmana, Asvalayana Brahmana, Galava Brahmana

Brahmanas of the Yajurveda: Charaka Brahmana, Svetasvatara Brahmana, Kathaka Brahmana, Maitrayani Brahmana, Jabala Brahmana, Khandikeya Brahmana, Aukheya Brahmana, Haridravika Brahmana, Tumburu

Brahmana, Ahvaraka Brahmana, Kankati Brahmana, Chhagaleya Brahmana.

Brahmanas of the Samaveda: Bhallavi Brahmana, Kalabavi Brahmana, Rauruki Brahmana, Satyayana Brahmana, Talavakara Brahmana

Miscellaneous Brahmanas: Aruneya Brahmana, Saulabha Brahmana, Sailali Brahmana, Parasara Brahmana, Mahasaravi Brahmana, Kapeya Brahmana, Rashasyamnaya Brahmana, Nirukta Brahmana, Anvakhyana Brahmana, Bashkala Brahmana and Mandukeya Brahmana, Trikharva and Karadvisha Brahmanas.

Aranyakas of the Rigveda: Aitareya Aranyaka, Kaushitaki Aranyaka, Samkhayana Aranyaka

Aranyakas of the Yajurveda: Brihadaranyaka (Madhyandina), Brihadaranyaka (Kanva), Taittiriya Aranyaka, Maitrayaniya or Brihad Aranyaka of Charaka Recension

Aranyaka of the Samveda: Talavakara Aranyaka or Jaiminiya Upanishad Brahmana

Compilation of Aranyakas: Saunaka, Asvalayana, Katyayana, Yaska, Panini, Pinmgala, Vyadi, Kausta.

Upanishad: 108 Upanishads out of which 20 are major.

Dharma Sastra - Aapastambha Dharma Sutra, Gautam Dharma Sutra etc. This is widely spread up sastra.

Smriti - Code of conduct (Manu Smriti etc). There are several Smritis.

Itihas & Purana - Ramayana, Mahabharat, 18 major Puran and 18 Uppa Purana etc.

Mimansa & Nyaya which include - Sankya - Yoga, Nyaya - Vaisheshika, Purva Mimansa - Uttar Mimansa. Four School of Buddhist Philosophy, Jain School of Philosophy, Shaiva Vaishnava, Shakta all comes under these schools of Philosophy. These are all traditional vidyas.

Volume of Documented Organized Traditional Knowledge System

For a long time, perhaps for more than a hundred years, the scholars of Indology have been trying to compile the available catalogues and lists of known Indian manuscripts in various languages. After their long and tedious search, they have recently come to the conclusion that there exist probably two thousand catalogues of Indian manuscripts in Sanskrit, Pali, Tamil, Prakrit, etc. These two thousand catalogues are from perhaps seven or eight hundred different locations and about one third of these locations may be outside India. Each of these catalogues

lists a hundred or two hundred manuscripts. The scholars thus have a listing of two to four lakh Indian manuscripts.

We do not know how many of the manuscripts listed actually survive today, and of those, which survive, how many are in a condition fit enough to be opened and read, or even microfilmed. This vast available literature comes just only under 50 word roots (Dhatu) of the Sanskrit Grammar whereas we have studied about 2800 word roots. Usages of 2750 roots are completely lost now. We can only imagine the vastness of the literature and the lost knowledge.

In a somewhat similar exercise of scholarly thoroughness, some eminent scholars of India keep mentioning that there are some fifty crore (500 Million) Indian manuscripts in various Indian languages - Bangla, Oriya, Kannada, Telugu, Tamil, Malayalam, Assamees, Gujarati, Marathi, Hindi, Punjabi, Bhojpuri, etc which have survived till today.

These huge amounts of organized systems of great literature and philosophy have created self-respect and pride in Hindu society. This self-respect and pride had ignited the Hindu society to resist the onslaught of Greek, Bactrian, Partho-scythian, Kushan, Saka and Barbarian Hun and finally defeated them. Same spirit continued in Hindu society and from 7th century onward Hindu society resisted Arab, Turk and Mongol and defended the civilization for thousands of years. The society also resisted Portuguese, Dutch, French and British.

With these entire onslaughts, we are the only surviving civilization with continuity of dharmic, cultural, social and spiritual ethos whereas other civilizations of world like Roman and Greek of Europe, Egyptian of Africa, Mesopotamian, Assyrian Persian of Middle-east and Gulf, Incas, Maya and Aztec of South America were wiped out and become part of archaeological museum. Credit for survival of Hindu Society also goes to the traditional knowledge system, which created self respect and pride in Hindu Society. This pride inspired them in resisting the foreign invasion.

State of Sanskrit learning in India

How many in India today have any fluency in Sanskrit? Now-a-days, one can even get a doctorate in Sanskrit without seriously learning the language. One can write a thesis in English and obtain a Ph. D. degree for Sanskrit literature from most Indian Universities. There may be a thousand or so of the traditional Pandits who still retain a certain level of competence in the language. Among the families traditionally associated with Indian learning, there may still be four or five lakh individuals who can read and understand Sanskrit, though small number would be fluent enough to converse in it. That is about all the talent we have in the language.

Gandhian scholar Shri Dharampal recorded in his memoirs that "South India has had a long tradition of Sanskrit learning. Some time ago, I happened to meet Sri Sivaraman, the scholarly former editor of the Tamil daily Dinamani. I asked him about his estimate of the number of people in South India who might still be fluent in the language, and who might feel comfortable reading, writing and speaking in Sanskrit. His answer was that there was probably not a single such individual in South India. There might be, he later said, about a thousand scholars, definitely not any more, who would have some level of competence in Sanskrit, but even they were unlikely to be fluent in the language."

The All India Radio, Akashvani, has been broadcasting an early morning news-bulletin in Sanskrit for many years. But there are probably not many who listen to this bulletin.

This is the state of Sanskrit learning in the country. We have to accept the condition to which we have been reduced, and we must start building up from there. RSS and VHP supported organizations - Sanskrit Bharati and Bharat Sanskrit Parishad are trying hard to popularize simple and spoken Sanskrit. Their efforts in this regard need our encouragement and support.

Institutes for learning Sanskrit in India

We have a large number of Institutes founded with the specific mandate of studying the various texts of Indian literature. Many high scholars have spent long years investigating various parts of the Indian corpus. But, these institutes and the scholars, it seems, have been looking at Indian literature from the perspective of modernity and from the eye of Colonel Joseph Boden Will. Indology, by its very definition, is the science of comprehending India from a non-Indian perspective, and practically all Indian scholars and Indian institutions engaged in the study of Indian literature fall within the discipline of Indology.

All the institutions, colleges and universities of Indian learning of 19 century were conceived along the lines laid down by western scholarship. Their organization had no relation to the traditional organization of learning in India. They were in fact structured on the pattern of the corresponding western institutions, especially those in London. And, their main objective was to enter into the various streams of modern western scholarship. Various institutes such as Bhandarkar Institute at Pune, Sanskrit colleges in big cities were founded during that time.

The Sanskrit University at Varanasi is one classical example of the institutions of Indian learning that came up in India during 19th century. An institution known as the Queen's College had been functioning in Varanasi from the times of Warren Hastings. Later the same college was named as Sampurnananda Sanskrit University. Today this University is counted amongst the most important institutions of Indian learning in the country. Most of the other Indian institutions engaged in the study of Indian literature have similar antecedents and inspirations behind them.

And more of the same type is being established even today.

To gauge how deeply modernity has insinuated itself into the work of Indian scholars, it is enough to have a look at Sri Sripad Damodar Satawalekar's translation of Purusha Sukta, and his commentary on it. Sri Satawalekar reads the Purusha Sukta to mean that from the sacred effort, Tapas of Brahma there arose, at the beginning of the Universe, a modern government with its varied departments. And, he goes on to name some twenty departments, which the Purusha Sukta supposedly defines. From Sri Satwalekar's commentary it seems as if the content of the Purusha Sukta is merely a concise prescription for the establishment of a government on the pattern of modern departmental bureaucracy. Sri Satwalekar was recognized and respected in India. His intellect, his commitment to the Indian thought, and the intensity of his effort were indeed very high. But even he got so carried away by the unrelenting sweep of modernity that he began to see a prescience of the modern governmental organization in the Purusha Sukta. Much of the work done by the Indian scholars on Indian literature is similarly tainted by the touch of modernity and influenced by westerners.

Motive behind colonial approach to Sanskrit learning

The Founder of Boden Chair of Oxford University and Endowment in Professorship in Sanskrit language Col. Joseph Boden's will dated 19th November 1811 in Lisbon is presented here. Extracted from the Principal Registry of the probate divorce and admiralty division of the High Court of Justice -

"In the name of God Amen, - I Joseph Boden Late a Lieutenant Colonel in the Honorable East India Company's service and now about to depart to the Island of Madeira being of sound and disposing mind memory and understanding (praised be Almighty God for the same) do the day and year hereunder written make and ordain this my last Will and Testament in manner and form following ------
I do hereby give and bequeath all and singular, my said residuary estate and effects, with the accumulations thereof if any and the stocks funds and securities whereon the same shall have been laid out and invested unto the University of Oxford to be by that Body appropriated in and towards the erection and endowment of a Professorship in the Sanskrit Language at or in any or either of the colleges in the said university being of opinion that a more general and critical knowledge of that language will be a means of enabling my countrymen to proceed in the conversion of the natives of India to the Christian religion by disseminating a knowledge of the sacred scriptures amongst them more effectually than all other means whatsoever."

The First Boden Professor of Sanskrit in Oxford University was H.H. Wilson. Then it was Monier Williams and he was followed by Max Müller[119]. Personal letters of Mr Max Müller gives a true picture of the writer's inner mind. Such letters are very helpful in estimating his real nature and character. In a letter to his wife in 1886 A.D. Max Müller wrote:

This edition of mine and the translation of the Veda will hereafter tell to a great extent on the fate of India ... It is the root of their religion and to show them what the root is, I feel sure, is the only way of uprooting all that has sprung from it during the last three thousand years."

In a letter on 16th December 1868 A.D he writes to Duke of Argyll, the Minister for India:

"The ancient religion of India is doomed and if Christianity does not step in, whose fault will it be?"

You can understand how bias was colonial scholarship of Sanskrit learning. Max Müller's bias is now an open secret. The strange factor is that Max Müller does not understand simple Sanskrit and he cannot write and translate. Then what about his Vedic knowledge?

Disastrous consequences of not knowing proper Sanskrit Grammar and Literature

Mr Max Müller was doubly blind. One because of his bias and prejudice against Hindu knowledge system and second he was totally ignorant in Sanskrit language and literature that led to disastrous translation of Rig Veda[120]. It was more than once that Max Müller admitted his shortcomings as a scholar of Vedic Sanskrit. He freely owned that while he was busy with the work of translating the Rig Veda he took help from Sayanacharya. Following is a quote from his book "My Autobiography" - "Over and over again I was stopped by some short enigmatical reference to Panini's grammar or Yaska's glossary, which I could not identify.... How often I was in perfect despair, because there was some allusion in Sayana which I could not make out, and which no other Sanskrit scholar, not even Bournouf or Wilson could help me to clear up. It often took me whole days, nay weeks, before I saw light."

[119] Max Müller never occupied the Boden Chair. He campaigned heavily for it when Hyman Wilson died in 1860. But the chair was awarded to MonierWilliams,, the same year. He was Oriental SubLinrariann at the Bodliean Subsequently Oxford created a new Professorship in Philology in 1868 for Max Müller.

[120] Ed.For a detailed investigative report on the extent of scholarship amongst the highly regarded Sanskritists of Europe see for instance Prodosh Aich, "Lies with Long legs", Samskriti, New Delhi, 2005

In a letter which Max Müller wrote (September 28, 1898) to Pandit Chavilal of Kathmandu (Nepal) only about two years before his death he frankly admitted the inadequacy of his knowledge of Sanskrit. Since this letter had been kept out of Max Müller's first biography (The Life and Letters) and found no space in the 2nd biography "Scholar Extraordinary" by Nirad C. Choudhary. Full text of the letter is produced here.

"7 Norham Gards, Oxford,
28th September, 1898,
Pandit Chhavilal,
Dear Sir, accept my best thanks for your Natakas, Sundara Charita and Kushalavodaya, the Vritalankara, and the Sanskrit verses addressed to me. As soon as I find time I hope to read your two plays, but I am getting so old (75) and have still so much to do, that I have but little leisure left to me. I am surprised at your familiarity with Sanskrit. **We, in Europe, shall never be able to rival you in that**. **We have to read but never to write Sanskrit**. To you it seems as easy as English or Latin is to us. You see, we chiefly want to know what INDIA is and has been - we care for its literature, its philosophy, etc and that takes up so much time, that **we never think of practicing composition**, that we can admire all the more because we cannot rival, and I certainly was filled with admiration when I read but a few pages of your Sundara Charita. And now a question. Mr Bahramji Malabari is publishing at Bombay (India Spectator) translation of my Hebert Lectures in Marathi, Bengali, Gujarati, Tamil, etc. He is very anxious to find a scholar to translate them into Sanskrit. One translation was made, but it was too imperfect. Would you undertake that work? Of course, you would be paid for your trouble"

That means Max Müller himself was unable to translate his own English lecture to Sanskrit. It was perhaps the first time that Max Müller had so candidly confessed to anyone that he was no scholar of Sanskrit and much less of Vedic Sanskrit. Very plainly he had admitted that he was not capable of writing flawless Sanskrit. What he could do was only to read (perhaps that too incorrectly) what some others had written and that too in all probability without being sure whether all that he was reading had been correct or incorrect. Yet, Max Müller is put into worldwide circulation as the greatest and as an extra ordinary scholar of Vedic Sanskrit like a counterfeit coin.

Schopenhauer had this to say regarding German and Western Scholars of Sanskrit

"I add to this the impression which the translation of Sanskrit words by European Scholars, with very few exceptions, produce on my mind. I cannot resist a certain suspicion that our Sanskrit Scholars do not understand their text much better than the higher class of school boys their Greek and Latin"

properly:

Just a small example "Aja Yastabyam" - Literal meaning in modern Sanskrit , Aja means Goat - Yastabyam - Perform Yaaga (Sacrifice). In ancient Sanskrit Aja means which cannot reproduce. Again the Sastra explains Aja means Sapta Varshansi Brihaya - means 7 year old paddy (dhan - rice covered with husk) i.e. seven-year-old paddy cannot produce (germinate) another paddy. The seven-year-old paddy is used in performing Yaaga.

Early Efforts to Preserve and Popularize this Organized Body of Traditional Knowledge System

During the Hindu Renaissance of 19th century, the last quarter of the century Swami Dayananand Saraswati challenged the western indologist and their Sanskrit scholarship. In the beginning of 20th century Swami Shradhananand, the follower of Swami Dayananand made a beginning to preserve and popularize and produce quality scholars in the Vedic knowledge system in a true Hindu perspective system for defending Hindu society. He founded Gurukul Kangadi at Haridwar, which created a great enthusiasm and hope. British colonial system was dead against such efforts. They did not recognize the Degree of Gurukul Kangadi. In spite of this denial of recognition, there was a deep commitment, which kept them going. In the early phase they produced good scholars and these scholars did great work also. Inspired by the great work of Gurukul Kangadi, a number of Gurukul institutions have come up in northern Bharat. These Gurukul also produced good scholars and did great work for the preservation of Vedic knowledge system in their own limited way without any British India Government support. Though they had survived and flourished during British rule but the irony is that they started diminishing in independent India. Most of them are closed or are the verge of closure.

In the beginning of the same century Sanatan Dharma Sabha also started some Sanskrit Vidyalaya such as Rishikul. They did little but failed miserably. Maharshi Mahesh Yogi did great work in popularizing Vedic patha parampara during 1980s onward. Because of mismanagement this sacred efforts also failed. RSS & VHP supported organization - Sanskrit Bharati and Bharat Sanskrit Parishad started popularizing simple spoken Sanskrit. This is not enough. They also started Ved Pathashala to preserve ved paatha parampara. To my knowledge this is also not going to work. The Gurukul and pathasala started by these organizations is not enough to preserve the traditional Vedic knowledge.

The Bitter Truth of Indian Sanskrit Learning

During the Independence struggle of 19th and 20th century, there were traditional Gurukul and Pathasala. Except a few none of these Gurukul and Pathasala produced any great revolutionary or revolutionaries or national leader. The truth is that most of the revolutionaries and national leaders were product of English schools & colleges run by

Britishers or DAV College and Schools run by Arya Samaj or national school/colleges run by independent foundation or society.

Drawbacks of the Gurukul and Pathasala System in the Modern time

The Gurukul and Pathasala system of teaching focuses only on teaching Sanskrit language and literature to get a degree. They are not taught modern science, mathematics, history, geography, sociology, etc. Because of that they don't get proper knowledge or exposure of the society and happenings in the world. They suffer deep inferiority complex not only in knowledge but also in dress and sports along with lack of confidence. Once they get degree from colleges/university, t**he only option as a career before them is to become a teacher or priest in temple.** They cannot become doctors, engineers, scientists, professionals, businessmen and administrators. They are unable to face the students educated in modern university/colleges. Therefore they never encourage their children also of other children to join the Pathasala or Gurukul. Thus this system does not get intelligent students to study the traditional knowledge system. If you do not get a good student you cannot produce a good scholar and teacher. When you do not have good student and teacher coming in the system, the system may suffer loss. This is happening in the case of Sanskrit learning in independent India.

Reintroducing the Traditional Knowledge Systems in Gurukul and Pathasala

First we have to bring back confidence in the students of Gurukul and Pathasala by introducing the latest syllabus system of science, technology, mathematics, history, sociology, etc. together with blending the traditional knowledge system. After education, the students of such Gurukul and Pathasala should be able to pursue any career like doctor, engineer, scientist, professional, businessman or administrator. They should be proud of their Gurukul or Pathasala education system. On the same time they will be able to tell the modern university/college educated students **with guts and confidence that gentlemen what you know is also known to me but what I know, you do not know. That will make the difference.**

How to Popularize the Traditional Knowledge System

We have to create another renaissance in the traditional learning system:

- i. Some Hindu corporate houses have to create big foundations and invest good amount of money,
- ii. Group of dedicated individuals should get together and create a foundation with lot of money and,
- iii. We have to identify / locatededicated traditional scholars scattered here and there.

We have to establish two types of Institutions:

- i. **Institutions for Serious Studies of Traditional Knowledge System**

Our focus on this institution should be on a serious study of organized traditional knowledge system of Vedic, Shramanic Sanskrit language and literature along with modern science, technology, mathematics, etc. Those students who want to leave these institutions in course of their study may join the modern education system in college or university for their professional career. They should have free choice but at the same time they should not regret the time they have wasted in serious study. Those who wish to continue and devote time in this serious study will continue. This will produce serious scholars who would again revive the whole traditional knowledge system.

General Study

We have to establish new models of boarding school focusing on the teaching of modern science, technology, mathematics, history, sociology, etc. which blend with organized traditional knowledge system of Vedic and Sanskrit language and literature with Hindu values. Those students during their course of study get motivated and want to devote time for serious study of Vedic and Sanskrit language and literature can also join serious study institution. Otherwise they can continue their course and join in any professional career. Once they go to the society after finishing their studies, where they will meet and interact with other group of professionals and students educated in modern university and college. **The students of model school should be able to tell the modern university/college educated students with elan, conviction, and confidence that 'gentlemen what you know is also known to me but what I know, you do not know. That will make the difference'.** Then the society will realize the importance of traditional knowledge system and will then start in participating and popularizing the traditional knowledge system.

When the above happens, the memory of our Hindu society will be restored and begin to form appreciation of geography and history of Hindu civilization whereby the real task of building strong Hindu nation and society will begin in real sense and spirit.

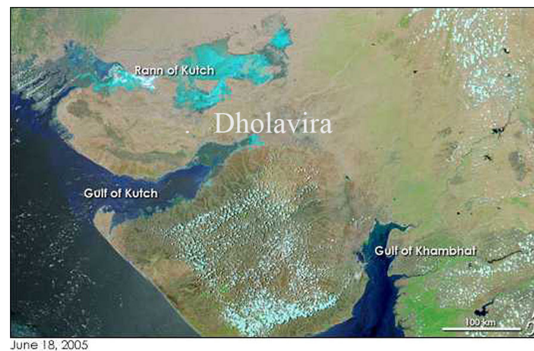


Chapter 18 Dholavira's geometry: a bridge between Harappan and classical times and concepts

Michel Danino

Abstract

Dholavira, a unique harappan site in the rann of kachchh, displays elaborate town-planning. its massive fortifications delineate nested enclosures that follow highly precise proportions. Those ratios combined with the city's dimensions allow us to calculate precisely the unit of length used for the fortifications, and to relate it to the ivory scale found at the nearby site of lothal. Dholavira's ratios and units are both visible at other harappan sites, and are shown to be related to historical unit systems -- a significant finding, since the conventional view was that there was no connection between Harappan and historical town planning. Finally, the paper shows that some of the abstract concepts underlying Dholavira's geometry appear identical to concepts of classical Hindu architecture and philosophy.



Chapter 19 Indian Chronology – Problems and Perspectives

(A Note)

Y. Sudershan Rao[121], Prof of History (Rtd),Kakatiya University,Warangal, AP, India

The modern genre of history which is two centuries old by now insists on two prerequisites, time-space coordinates, to situate any event or person in a historical context. The heuristics of any available evidence conforming to these coordinates will distinguish a historical fact. These determinants of authenticity of a historical record are borrowed from the principles governing the commercial and property transactions of the medieval and early modern Europe. The 'instruments' of commercial nature will directly and materially affect the concerned individuals and/or their succeeding one or two generations. Therefore, the genuineness of the document in question is subjected to scrutiny and if necessary corroborative evidence is also required in resolving the legal disputes arising out of such transactions. The application of these principles to the impersonal matters like historical inquiries without any discretion complicates the issues rather than solving them. One cannot deny the existence of his forefathers preceding four or five generations because he does not know their names, the dates of their births and deaths or the locations where they lived. For the history of the recent past, these two coordinates may appear to be more relevant as the recent happenings have direct bearing on the present and near future. We get different types of source material for writing about a recent happening. A historian can make use of corroborative sources to attempt a historical narration. European history being relatively recent, the time-space determinants may hold validity to an extent.

[121] He owes his understanding of the subject to Sathguru Sivananda Murty ji, Bheemunipatnam, A.P. India.

When we are attempting to write the history of the civilizations and the peoples of remotest past whose antiquity cannot be traced, a historian should use his discretion applying commonsense, reason and logic, as the basic tenets of scientific method of inquiry while examining the available historical source material to bring out the essence of the remote history for the benefit of mankind.

Bharat Varsha, the Indian sub-continent or South Asia, is endowed with voluminous record – oral, literary and archaeological – of the history of not only its people and their culture but the history of entire Creation and its secrets. The rich oral tradition which has come down to us through infinite number of generations defies our estimation of its origin in every respect because it speaks of mind boggling reckoning of Time and infinite creations. Veda is believed to be eternal. It is a revealed knowledge. The revelations of great sages are handed down to us as oral tradition. The classification of this knowledge, Veda, was attempted by Sage Veda Vyaasa whose times are connected with the great event, the Battle of Kurukshetra. Sage Vyaasa had much higher objectives for this classification than making it a chronological account. Most of the mantras included in the 'Samhitas' of the four books of Veda being common, the Sage has benefited the humanity with the Knowledge being presented in four different ways for varied purposes. The sage had given each version of the Veda to one of his able disciples for preservation and propagation. Modern historian assigns different periods for the origin of Rigveda and other Vedas citing certain changes in society to legitimize the Linear theory. When the author of these four versions of Veda was one and the same, it is a matter of simple commonsense that these books (oral) are contemporaneous.

Sage Vyaasa also gave us the Purana which speaks of the history of many creations and major events therein, both Cosmic and mundane. The genealogies of Rishis and major dynasties of rulers are given in the Purana which Sage Vyaasa has recorded as handed down to him by his father, Sage Parasara. Sage Parasara got this knowledge of remote history as a revelation. Out of this one body of Purana (Vishnu Purana?), eighteen Maha Puranas were composed during Mahabharata times. The major content and characteristics of these Puranas being the same, each Purana is endowed with some peculiarities of its own in its presentation and emphasis given to a major concept or phenomenon. Subsequently, many subsidiary Puranas, Sastras, Darshanas, Sutra and Kavyas literature were composed in different periods of time and published through oral transmission. The Puranic literature has been updated periodically. Though the origin of Puranic literature could be dated to Mahabharata and immediately after Mahabharata times, we cannot fix up the exact time when the literature was made available in written form for the first time. Since the material used for writing is of perishable nature, even the earliest manuscript found by us turns out to be the latest written version of the original

work. The modern scientific dating methods might at best help us estimating the approximate date of an artifact or manuscript (conditions apply!). A historian with unprejudiced sense of reasoning would only say that the dating of the available copy can hardly determine the date of the original work.

Bharat has no parallel in the world in respect of the quality, quantity, antiquity and continuity of its knowledge store. Vedic and Puranic literature give us very valuable data for tracing the history from the remotest past to the recent times. It may not be possible to assign a fixed date for every event or episode of the remote past which of course serves no purpose. But on that score the episode cannot be dismissed as fictitious. The episodes in the Vedic and Puranic literature should not be blindly taken in its literal sense. They are encoded narratives. The solution for a riddle posed in one episode cited in one Purana could be found elsewhere in the same work or in some other Purana. It needs a mega view of the whole literature to understand and interpret an episode. So micro-studies should be attempted with only macro-understanding. Every ancient work, though specializes in any Sastra (science), or Dharma (conduct), or Art (music, dance or fine arts), or Itihasa (history) is encyclopedic in its nature and gives the benefit of a bird's eye view of the universal knowledge and the Sanatana Dharma. Thus, every ancient work, irrespective of its special focus on an area, is capable of giving universal consciousness to a sincere seeker. In ancient Indian knowledge system, a specialty did not mean ignorance of the rest as we understand the specializations today. Holistic view was the order of the day. Therefore the problem should not be studied in isolation.

Further, every ancient work was aiming at raising the conscious level of its clientele from the mundane to the Ultimate through the known to the Beyond. The Dharma as a Sutra (thread) runs through all the ancient literary forms. The essence of Vedic thought is given in Puranas and Itihasas for mass consumption as educative entertainment. Sanatana Dharma, the basis of the Vedic thought and Puranic knowledge, is explained through the Epics as live narratives. In view of the mega time scale, the ancients have divided the eternal Time in Yugas, Mahayugas, Manvantaras and Kalpas. With the help of Puranic genealogies and the astronomical data available from the Mahabharata, many scholars have attempted to fix the date of Mahabharata War with negligible variations. These studies would confirm that the Great Event took place around 3000 BC. Now, it is not difficult to arrive at a reasonable time-frame for the Mahabharata which draws a line between the remote and recent past. Modern historian, free from prejudices, can fairly reconstruct Indian Chronology taking the date of the Great War as the sheet anchor. Since the chronology is the spine of the body of history, the gaps or missing links may be covered with logical interpretation of the valuable data from the ancient literature.

Heuristics and hermeneutics employed in the modern Historical Method for studying ancient societies of remote past, when associated with common sense, reasoning and logic would help resolve many misunderstandings and misconceptions entrenched in the present historical writings. What is basically required of a modern historian is a positive approach to knowing truth.



Chapter 20 Synopsis

Kosla Vepa PhD

In the first essay titled Warnings of History, Dr. Hanuman Chowdary, reminds us that the concept of the nation state is a very recent one. This is a pertinent observation especially in light of the fact that Winston Churchill, when reminded that the People of India did not share in the benefits of nationhood in the same manner as Australia and Canada, barked in reply, that India was no more a nation than the equator. He ignored the fact that a Sankaracharya could traverse the length and breadth of the country without any passport or visa, even though he was just a boy yet to reach his teenage, and without the endorsement of any King or ruler. He could make himself understood in every corner of the country without any difficulty Even if we allow for the extreme prejudices of Sir Winston, and his disdain for the Indian people, the irony here lies in the fact that his own nation did not achieve the status of nationhood (with the appellation Great Britain or United Kingdom) till the 19th century. So when the Winston Churchill's of the world insist on this argument they should be asked to clarify by replying to the query Compared to whom? It was an Englishman, Sir Henry Maine an influential Anglo Indian scholar and former Vice Chancellor of Calcutta university, who was also on the Viceroys council, pronounced a view that many Englishman shared about the unification of Germany and who expressed the thought that was very prevalent in the late nineteenth century, namely that 'a nation has been borne out of Sanskrit'. It may not astonish most Indians that the nation he was referring to was Germany, which took to the study of Sanskrit in great earnestness and thereby developed the grammar of their own language, and more importantly saw themselves as the inheritors of the legacy of the Vedic Aryans. What is troubling is the considerable hubris in their assumption that only the Indo Europeans of Europe are entitled to pronounce views on the whole gamut of topics related to the Ancient Indics.

Prof Narahari Achar's paper on Astronomical dating of some of the key events in Bharatiya Chronology is very definitely an important piece of evidence in support of the traditional puranic timelines. The use of astronomy or archaeo-astronomy to date historical events is hardly new, since it was used by astronomers and scholars such as the Scottish mathematician John Playfair, the French astronomer Jean Sylvain Bailey, and Herman Jacobi in Germany, to determine the antiquity of the Indic ancients. All three of them came up with a date for the Vedas which was far more ancient than was the prevailing conventional wisdom that everything in India happened after the advent of the Greek. For reasons not entirely obvious to me, these findings were always given short shrift in the past.

What is new, in the last decade is the availability and use of so called Planetarium software to reproduce the sky inscriptions of the particular event and compare whether the calculated positions match with those observed during a particular event. Conceptually and algorithmically, the problem is a relatively straight forward one, but it may involve running combinatorially large numbers of cases, which is a relatively simple matter given the speed of today's processors. We have summarized the findings of Prof Achar in the following table, to reconstruct the sequence of events for which sky inscriptions are available

Table 6 Summary of selected events in the Mahabharata

	Description of Event	Dating
	Sri Krishna, on his final peace mission, set out for Hastinapura, when the moon was at the asterism Revati.	September 26, 3067 BCE
	Krishna arrived in Hastinapura when the moon was at the asterism Bharani.	September 28,3067
	The lunar eclipse	September 29, 3067 BCE
	The solar eclipse at Jyestha	October 14, 3067 B.C.
	The Great Bharata War	November 22, 3067 BCE
	Balarama sits out the war and sets out for pilgrimage along the Sarasvati	November 1, 3067 B.C.
	Balarama returns from his pilgrimage, on the last day of the war	Dec 12, 3067 BCE
	The winter solstice occurred on	January 13, 3066 BCE
	Bhishma's expiry	January 16, 3066 BCE
	Birth and nirvana of Sri Krishna (we have used 81 years as his lifespan but some traditions put his lifespan as 197 years) with a birthdate of July 21,3228 BCE	3112 BCE to 3031 BCE
	The comet Mahaghora appeared at the asterism Pushya	October ,3066 BCE
	Birth and Nirvana of Lord Buddha	April 9, 1887 to March 27,1807 BCE
	Birth and Nirvana of Adi Sankara	April 5, 509 BCE
	Beginning of the Vikrama Era (Sukla pratipada)	March 14 , 57 BCE
	Salivahana Saka	78 CE

The degree of synchronicity with the traditional puranic chronology as described for example by Pandit Kota Venkatachalam is indeed astonishing.

The next paper by Stephen Knapp alludes to the fact that the date of the Buddha has been seriously misrepresented as a result of working everything back from the date of Alexander's invasion. If Alexander's invasion had a significant impact on India that methodology might have some value. But the reality is that Indian historians have been singularly silent about Alexander and there is hardly any mention of him. Hence it does not make sense to use Alexander's date as a major benchmark in Indian history. That coupled with the obsession on the part of the Europeans to ensure that India should have no date or history prior to that of the Greeks, resulted in this gross error of Buddha's date. This is one of the dates that Prof Achar has verified and has found the conventional dating to be in error.

In his essay on History of Ancient India, distorted and mutilated, Dr. Motwani, who happens to be a Fulbright Scholar, chronicles some of the reasons and events that led to the distortion. He alludes to the voices that once spoke up against such a distortion. One of them was E Pococke[122] who wrote a book called India in Greece, which is rarely quoted by Western Indologists for the simple reason that draws the inconvenient conclusion that Grecian culture was impregnated a long time ago by the Indo-Vedics. Dr. Motwani makes several other points in his well researched paper and the reader would be amply rewarded for taking the time to read and digest the contents of this essay which has many little known nuggets.

The essay by Vamadeva Shastri is quite significant since it establishes evidence that the Vedics were utilizing the 360 degree ecliptic and the division of the Zodiac into 12 equal regions along the ecliptic as it is currently used in the west. This establishes the terminus ad quem date for the mention of the Western Zodiac or rasi to be prior to the start of the Kali Yuga, since the composition of the Rig Veda had been completed long before this date. In support he quotes the verses of Dhirgatamas, one of the Rishis who composed the Rig Veda. This work has been corroborated by Dr. Subhash Kak in a series of papers[123][124] as well as in a book[125].

In an interesting presentation titled Daevas and Asura: the ongoing battle between Iconism and Aniconism. Dr. Anirban Banerjee explores the origins of the conflict between Iconism and

---

[122] E Pococke India in Greece, or Truth in mythology, published by John J Griffin in 1852

[123] Kak, Subhash. Birth and early development of Indian Astronomy, in Astronomy across cultures. History of Non-Western Astronomy by Elaine Selin, Kluver, 2000

[124] Kak, Subhash, Babylonian and Indian astronomy, Early connections, available at http://arxiv.org/abs/physics/0301078

[125] Kak, Subhash., The astronomical code of the Rig Veda, Aditya Prakashan New Delhi, 1994

Aniconism, exemplified in the modern age in various degrees by the Prophetic religions of the World and the Dhaarmic faiths originating in India. The presentation was noteworthy in the many unique insights that he brought to bear on this issue, an issue which divides the world into implacable competing civilizations even today. He emphasized the viewpoint, oft forgotten in the heat of debate that the Sanaatana Dharma encompasses the entire gamut of Iconic and Aniconic belief systems. By so doing, the Hindu is in fact asserting that such a distinction is a matter of personal belief and that it is not a fundamental pramaanic issue. Such a viewpoint however, provokes those individuals who make Aniconism a fundamental dogma, to the extent that the Hindu is dubbed a pagan, a heathen, an infidel or a Kaffir. The very nonchalance that the Hindu exhibits towards this issue is a matter of great discord to those belief systems that are prophetic and that depend on the intermediary of a prophet to intercede on their behalf.

MA Jayshree and MA Narasimhan have contributed a thought provoking paper by suggesting that we go back to our puranic, vedic and other literature to decipher our history using time tested Pramaanic Epistemology to sift through the vast amount of material that is available and determine whether the story hangs together in a logical fashion. If I may quote from their paper since I can t say it any better. They start with Kalhana's Rajatarangini

' "History will be the narration of events as they happened, in the form of a story, which will be an advice to the reader to be followed in life, to gain the purusaarthas namely Kama the satiation of desires through Artha the tool, by following the path of Dharma the human code of conduct to gain Moksha or liberation."

The Kalhanian formula seems to be the ideal perspective to be followed in writing history. For we feel that it will avoid to a large extant the subjective distortion that has invariably been creeping in to the histories written so far.

By accepting such a norm, History becomes relevant and contemporary and accepting the logic of the six systems of philosophy by which one can fine tune the authenticity of a statement based on just oral tradition along with the objective evidence of the artifacts available. That apart we also have the clear enunciation of the way of life (Dharma) enunciated in the smrtis. This can be applied at three stages Namely Dharma of nature, human dharma, and locational dharma. This helps one to come to conclusions which can be fairly logical and acceptable to the majority. It is after all, the conclusions that lands historians into controversy. The more objective it is, more comprehensive it is, more purposeful it is, will naturally lead to the reduction of controversies.'

Ancient Indian Dynasties is a synopsis of the book by the same name authored by Vishnu Swaroop Misra. Since we have not seen the book as yet, we hesitate to comment on the results of this work, but apparently the sheet anchor for the dating was taken to be Chandragupta Maurya's ascension to the throne, which in turn was assumed to be contemporaneous with Alexander's invasion. As a result the absolute dating in the book violates the fundamental

assumptions that we feel a correct history should adhere to. Nevertheless the considerable work done by the author on the dynasties before and after Kaliyuga may still be a useful resource from a relative dating perspective.

In "Vishaal Bharat", Dr. Motwani reminds us that in the Ancient Era, India was the undisputed cultural emperor of a large part of the known world. It has now become clear that for a greater part of her history India was the preeminent economic power. So much so that even as late as the 18^{th} century just prior to the assumption of power by the British, India retained her position as the preeminent economic power contributing about 22 to 25 percent of the world GDP. It is also true that India regards herself as a Civilizational power. By using this expression we wish to emphasize that, India influenced the culture and lifestyle of a vast area stretching from Greece to China and South East Asia. Most of this happened not at the point of the sword but by sheer force of ideas. Dr. Motwani gives us glimpses of this influence in his paper.

Former director of the CBI, Sri Joginder Singh ruminates on the nature of history and the many contradictions in Indian history, with a highly personal account of various events in Indian History

Dr. Suvarna Nalapat while agreeing that an accurate History and chronology are important cautions us that we should not blame the colonial overlord for our status today. We repeat, not for the first time, the issue is not one of blame, and the issue is not about Britain, for after all we remain in awe of the British for the extraordinary sagacity they displayed in prolonging their imperial rule by every artifice imaginable. We have also dealt with the systematic approach that the British used, to remake the weltanschuung of the Indic and to create an international image of the Indic that is much at variance with reality, and the success they achieved in the resulting internalization of these views by the Indic himself in our essay titled the South Asia File. Thus, we understand that the responsibility for being at the current state of affairs clearly lies with the people of the subcontinent, but at the same time we feel it is an obligation even a duty to seek the causes of this transformation to our current status, and let the chips fall where they may. The purpose of such a quest remains the same as always, and is in fact the main rationale for the study of history, to avoid making the same mistakes that we have made in the past

Dr.Oleg Perzashkevitch from the University of Belarus in Minsk presents a scholarly study of the etymology of the word Purohita in the Vedas and concludes that the Vedic Purohita implies both a Warrior as well as a Priest. This is a very interesting investigation, because there are several instances in Indian history where the Brahmanas have assumed the monarchical role or the role of intellectual Kshatriya. This is merely one more indicator that the so called caste

system was certainly not cast in concrete and that mobility between the professions was fairly widespread.

In his paper on Distortions in the Chronology and Historiography of Bharat's Contributions in Mathematics , Dr. Vijay Ashar, summarizes some of the distortions introduced by Occidental historians, who clearly were more concerned with the notion that the primacy of the Greek civilization and its antiquity should be preserved at all costs regardless of the fact that it may do violence to the truth. The lack of integrity exhibited by the majority of the Occidental scholars who studied India especially after the discovery of Sanskrit is chronicled in a forthcoming book by Vepa on Indology and the Indologists. Prof Prodosh Aich examines a limited subset of these individuals with devastating results, that will forever alter the perception of the Indic that the Occidentalists by and large, were essentially imbued with the minimum ethical requirement if integrity . The negation of this paradigmatic assumption is a shattering change in perception on the part of the Indic.

By emphasizing the need for correlation between Indic, Persian and Greek timelines, Dr. Muralidhar Pahoja has focused inadvertently on a traditional vulnerability of the Indic scholar, namely the propensity to ignore what happens outside the borders of the subcontinent. As a result Indians are immediately put on the defensive having to defend against an argument that they have little familiarity with when quoted an event outside the borders of the subcontinent. A case in point is the lack of historic records in ancient Greece. While the Occidentalists never fails to mention the supposedly cavalier manner in which the Indics treated chronology, he glosses over the fact that record keeping in ancient Greece was even more spotty. Apparently, dating of an event was done by referring to the Archon of Athens during that period. But this is merely a relative dating and puts the burden of verification of the chronology to a different event, in this case the Archonship of Athens. This is not an indictment of this approach, but a reminder that absolute dating of events in ancient Greece is not without ambiguities and lack of precision. Lack of familiarity with ancient Greek historiography leads the Indic to assume that the quoted event was inscribed in stone (no pun intended) and therefore cannot be challenged. Dr. Pahoja points out also the anomalies and conflicts between the dating of events that result when comparing the accounts the different peoples such as the ancient Persians. This paper opens up several avenues for further exploration and investigation and emphasizes the importance that Indic should pay to other civilizations, if she wishes to preserve and defend the antiquity of her own

In a very perceptive paper Om Prakash Misra has refuted the common misconception amongst Occidentalists (Occidentals who study the orient) that in ancient India, the despot or Authoritarian Ruler, was the norm rather than the exception. He marshals many facts to show that this is not the case and that such instances of Despotic rule were rare and the exception rather than the rule.

In the concluding essay on Hindu Traditional Knowledge systems, Swami Vigyanananda, notes that much of the ancient knowledge is fast disappearing from the Indic landscape, primarily because there are not enough new entrants into the traditional Gurukula system to maintain the transmission of knowledge. Even when these students graduate out into the world, they are at a disadvantage because they lack the confidence to compete in the global marketplace of ideas and knowledge. He suggest ways to remedy the situation, one of which is to include in the curriculum of the traditional schools the sciences, languages and the arts of the modern era and thereby create an Individual who has an advantage over the Occidental in that he is familiar with both systems .

(2978 words)



Chapter 21 Epilog

Kosla Vepa PhD

"Throughout the entire course of recorded European history, from the remote times of which the Homeric poems preserve the dim tradition down to the present moment, there has occurred no calamity at once so sudden and of such appalling magnitude as the famine which in the spring and summer of 1770 nearly exterminated the ancient civilization of Bengal. "

John Fiske, American Philosopher

The Unseen World, and other essays

We have come to the end of the task of chronicling the presentations made during October of 2007 at Dallas. But the real task of retrieving the authentic historical narrative of the Indic peoples remains ahead of us. It is time to start writing. What this seminar has demonstrated in ample measure is that at least among the cognoscenti there is recognition that the current historical narrative is grossly in error. In the short span of 175 years beginning with Sir William Jones, when he set himself the objective of reinterpreting the history of India, despite his meager knowledge of Sanskrit, the Colonial overlord has largely succeeded in revising the history of the subcontinent to fit his own preconceived notions of the standing of Indic civilization relative to that of his own Civilizational forbears in the Greco Roman world. While he was busy despoiling the country and reducing the world's largest economy to a pathetic third world status, he also ensured that the ancient history was devalued to a status subsidiary to that of Greece, by altering the dates. He went to extraordinary lengths to deny the cultural cohesiveness of the subcontinent and discouraged the notion that India was the progenitor of much of the culture of the ancient world, and largely succeeded in severing the umbilical cord between the PramAna of the Vedic era and the bulk of the populace. It is time to undo this damage, reconnect with the past, and learn what was of durable value, while at the same time discarding the chaff. But let us not throw away the baby with the bathwater, before we fully understand the portent of what is in the ancient texts.

There are 2 key facts to ponder.

The manuscript wealth of India is now estimated to exceed 5 million manuscripts, only 1 million of which have been catalogued but not necessarily read. The first step is to catalog and digitize the manuscripts, so that there is wide access to the manuscripts

Second, the proportion of the Global Indic population well versed in the English language will exceed, in about a couple of decades, every other subset of the English speaking population including the Anglo American with major implications , not least of which is the shift of the center of gravity of English language publishing to the Indian subcontinent

Some of the tasks that lie ahead

Categorize the periods of Indian history. My preference for a categorization leans towards the theme of evolution of our civilization. I will focus for now, on events up to 1200 CE. The following is an example categorization

The Ancients (7000 BCE-4000 BCE)

The maturation of Civilizational Values (4000 BCE -2000 BCE) includes the Sarasvati Sindhu Civilization. (the Brahmana Era, the Sutra era, the Upanishadic era)

The Puranic Era

The flowering of the Civilization

The Development of the Sciences and the Arts

Start writing, and spread the word.

What you, the reader can do

Encourage the learning of Sanskrit, history, archaeology, linguistics, mathematics, and astronomy – the forensic tools needed to decipher the past. There is a vast amount of the historical narrative yet to be discovered

Learn as many Indic Prakrit languages as you possibly can

Encourage your children to go into these fields

If you are into philanthropy, set up endowments for the study of history, and set up Indian history chairs in foreign universities.

Learn as much about other civilizations as you possibly can -Greek, Celtic, Russian, Chinese, Lithuanian, Babylonian, African, and Mesoamerican. It is very important for Indics to put themselves in the shoes of others, to understand their motivations. The absence of such expertise has been a traditional weakness of Indic scholarship. The purpose is not to become a pale copy of a European but to critically appraise other civilizations from an Indic viewpoint

Master the English language and preferably German, Latin and French. This is not an either or proposition. The future belongs to those who are Global in their weltanschauung while they are simultaneously rooted in their own tradition

Carpe Diem, there is not a moment to lose.

I trust the reader has enjoyed the collection of essays and the associated collection of Vignettes in the Appendix. It is my hope that those who read this anthology will be inspired to inform themselves in greater depth about this most ancient and durable of civilizations.

SO WHERE do we go from here

The journey has just begun and we have miles to go and promises to keep. The goal is a history which does not stray from the truth. It is a process rather than a fixed goalpost. Our ignorance over vast periods of our history is

so massive that it would need many decades of dedicated effort and a whole host of researchers to get to the semblance of truth without huge gaps in the Chronology

---

We end with a quote from Will Durant at in his story of Civilization at the conclusion of his volume on India. While we do not necessarily agree with all that he says, he reaffirms his belief that once again India will rise to contribute in its own unique way to the world

FAREWELL TO INDIA

One cannot conclude the history of India as one can conclude the history of Egypt, or Babylonia, or Assyria; for that history is still being made, that civilization is still creating. Culturally India has been reinvigorated by mental contact with the West, and her literature today is as fertile and noble as any. Spiritually she is still struggling with superstition and excess theological baggage, but there is no telling how quickly the acids of modern science will dissolve these supernumerary gods. Politically the last one hundred years have brought to India such unity as she has seldom had before: partly the unity of one alien government, partly the unity of one alien speech, but above all the unity of one welding aspiration to liberty. Economically India is passing, for better and for worse, out of medievalism into modern industry; her wealth and her trade will grow, and before the end of the century she will doubtless be among the powers of the earth.

We cannot claim for this civilization such direct gifts to our own as we have traced to Egypt and the Near East; for these last were the immediate ancestors of our own culture, while the history of India, China and Japan flowed in another stream, and is only now beginning to touch and influence the current of Occidental life. It is true that even across the Himalayan barrier India has sent to us such questionable gifts as grammar and logic, philosophy and fables, hypnotism and chess, and above all, our numerals and our decimal system. But these are not the essence of her spirit; they are trifles compared to what we may learn from her in the future. As invention, industry and trade bind the continents together, or as they fling us into conflict with Asia, we shall study its civilizations more closely, and shall absorb, even in enmity, some of its ways and thoughts. Perhaps, in return for conquest, arrogance and spoliation, India will teach us the tolerance and gentleness of the mature mind, the quiet content of the unacquisitive soul, the calm of the understanding spirit, and a unifying, pacifying love for all living things.

Appendices

Appendix A Resumes of Participants in HEC2007

Narahari Achar

Vijay Ashar

Anirban Banerjee

T Hanuman Chowdary

Michel Danino

Stephen Knapp

OmPrakash Misra

Jagat Motwani

Suvarna Nalapat

Jayashree AnandamPillai and M A Narasimhan

Muralidhar Pahoja

Vamadev Shastri (aka David Frawley)

Joginder Singh

Swami Vigyanananda

Yellapragada Sudershan Rao

Kosla Vepa, Session Chair

Kosla Vepa PhD

Dr. Kosla Vepa is a native of Andhra Pradesh who has had the good fortune to have been brought up and have had his education in various parts of India including, Bihar, Maharashtra, and Karnataka. He matriculated from Andhra University in 1955. Among the schools which he has attended are St.Xaviers College, Bombay, Karnatak University, Indian Institute of Science, Bangalore, and the University of Waterloo, Ontario, Canada. His highest degree is a Ph.D in the area of Engineering Mechanics. His professional and technical interests include Mathematical modeling of Mechanical Devices and Engineering Structures, Identification of mechanical systems, Mechanical Design Automation with successful research and development engineering experience in the Information technology, aero-engine and energy industries. He has worked for various companies including IBM (from where he retired), Lawrence Livermore Laboratories., General Atomics and Pratt and Whitney.

He has significant interests in a wide variety of subjects including ontological principles in science and philosophy, Ancient Indian history, Vedas and Vedanta, Mathematical Sciences in India during antiquity, strategic issues confronting thr Indic Civlization, the growth ,evolution of civilizations, to name a few. When he finds time he pursues his hobbies of photography and astronomy He divides his time between india and the USA in the San Francisco Bay Area



Some of the Publications and essays of Dr. Vepa of general interest

The Societal Stockholm Syndrome

India and the Great Game

What's in a name

Secularism and the Hindu

The Debate on the origin of the Vedics

India and US Missile defense

Indo-US relations (circa 1999)

A prolegomena to A History of the Indic Civilization

Vedic Mathematicians in ancient India PartI

Vedic Mathematicians in ancient India PartII

Vedic Mathematicians in ancient India PartIII

The South Asia File (monograph be published)

The Dhaarmik Traditions (monograph to be published)

Indology and Indologists – a study of people and their motives (Manuscript in preparation)

Ancient Indic contributions to the Exact Sciences – manuscript in preparation

The Indic Mathematical tradition, The Hindu Renaissance, Vol.IV no. IV, pp 19-24

Paper presented at the HEC 2006 in Los Angeles, Ca , Nov.2006

More at my websites www.indicstudies.us , www.vepa.us/dir00 , www.kaushal42.blogspot.com

Indic Studies Foundation

The Indic Studies Foundation, seeks to propagate a more accurate and rational approach to the study and dissemination of the Indian Civilizational ethos in the world, particularly in the United States and India. While India regards herself as a Civilizational Power, the image that India evokes is far removed from that of the Indics as they see themselves

Vision

We will be guided by the vision of an Indic Civilization that regains the relative stature that it had attained during the millennia between 5000 BCE and 1200 CE and establishes a more competitive posture as it scales new heights .

Indic Studies Foundation is committed to devising and executing plans that will focus awareness on the antiquity, diversity, intellectual vibrancy, the logical rigor and ontological scope of Indic civilization, the profound contributions it has made to many spheres of activity of humanity.

Comprehend the nature and breadth of adversarial theologies which seek to malign the Indic ethos, dispel lacunae and misconceptions in the understanding of Indic traditions in India and the Western hemisphere, as exemplified by the case of the California Text Book Misrepresentation of Ancient India in 2005/2006.

Explore the progress in realizing the unfulfilled promise and potential of this nation and its talented populace .

The Foundation will undertake a series of seminars annually with an exclusive focus on Indic history -- to specifically research the distorted history, ,assess its consequences, and remedy the situation by facilitating impartial/professional research into Indic history, and in addition will conduct programs to correct the history in the academia, media and in public perception.

In furtherance of these goals we have

Delivered lectures and presentations on the following topics

The South Asia File

The Indic Mathematical Tradition

India’s Contibutions to the sciences during Antiquity

Organized a seminar on Distorted History,Cause,Consequences and Remedies

We are planning a series of seminars in India and the US on the distortions in Indian History and increase awareness of the need for an accurate history of india and the process by which we may arrive at the same. We have prepared educational materials and calendars for dissemination to schools in India and the US.

Anirban Banerjee PhD

Professor, Department of Surgery,

University of Colorado at Denver

B N Narahari Achar PhD

Dr. Narahari Achar is a Professor of Physics at the University of Memphis. Originally from Bangalore, India where he had his early education, Narahari Achar has a Ph.D. in Solid State Physics from The Pennsylvania State University. He held positions at the Argonne National Laboratory and at the Bucknell University, before coming to the University of Memphis in 1984. He became interested in the ancient astronomy of India around 2000, when he started to teach a course in survey of astronomy for nonscience majors and has published a dozen scholarly articles on the subject. One of the major contributions is the determination of the date of the Mahabharata War using Planetarium software on the basis of astronomical references in the epic.

Professor Sudershan Rao, Yellapragada

Email: ysudershanrao@yahoo.com Professor, (Rtd),Dept of History & Tourism Management,Kakatiya University, Warangal, Andhra Pradesh, India, 506009 Phone: +91 870-243-8801-16 Ext 233 ,San Jose 408 423 8626

3770 Flora Vista Ave.,#603,Boardwalk apartments, Santa clara, Ca 95051

#5-11-643, Vidyaranyapuri, Hanamkonda, Andhra Pradesh,India, 506009

Phone: +91-870-245-5290

Recent Positions: Chairman University Forum for Social Studies, Kakatiya University, Warangal, a statutory University of the Government of Andhra Pradesh, India 2001-04 Professor Department of History & Tourism Management, Kakatiya University, Warangal, 506009, India .

National Fellow University Grants Commission, Ministry of Human Resource Development (HRD), Government of India, New Delhi awarded National Fellowship for the research proposal, on '**Understanding Indian History – search for an alternative'.** One of two awardees selected nation-wide for a term of two years.1993-1995

Member Indian Council of Historical Research (ICHR) Ministry of Human Resource Development, Government of India, an autonomous Statutory Government Funding Agency that monitors and promotes historical research in the country.

One among 16 senior Professors and Historians and the lone representative from the state of Andhra Pradesh 2002-04

President **Bharateeya Itihaasa Sankalana Samithi,** (An all India Organization for Collecting Sources of History) Andhra Pradesh State Chapter. A voluntary organization engaged in the promotion of **Research in Indian Culture, Religion and History** 2001-present

A critical study of the continuity of **Indian Culture and ancient Hindu Religion** in Southeast Asia with special reference to Modern Indonesia, 'Indonesia Indah'. (A series of articles based on the study of a cultural group led by Pujyasri Satguru Sivananda Murtyji of Vishakhapatnam, A.P. India, were published in a bilingual Cultural journal, ***Supatha***).

An analytical study establishing that the 'Andhra region' (Andhra Pradesh) served as the launching pad for **British Imperialism in South Asia** is presented in the book, **Andhra Between the Empires** based.

Mahabharata Project (1998-) sponsored by **Sanathana Dharma Charitable Trust**, Bheemunipatnam, A.P. attempts to critically examine the **Puranas and Itihasas** to trace the history of **Religion, Dharma and Culture of South Asia** from Vedic times to the beginnings of Historical period. The **Vedic Science of Creation, the Theory of Karma, Transformation of Yuga Dharma, Contribution of Sages to the Social and Spiritual Development** and the **historicity of Puranic Genealogies** are being studied under this Project. Considering the **Mahabharata War** as the sheet anchor for the History of Bharat, an attempt is made in this project to review the original sources- Astronomical, Puranic and Historical – for fixing the Date of the War.

Prof. Jagat K. Motwani, PhD

Education

M.A. (Eco), MSW (Baroda), Ph.D.(New York) and Fulbright Scholar

PROFESSIONAL EXP

Taught for 11 years at graduate schools of social work at Kashi Vidyapeeth Institute of Social Sciences, Varanasi and Baroda university.

Retired as Asst. Director of Social Service at the New York University Medical Center, Goldwater Hospital, New York

Psychotherapist & family therapist (Private practice, on part time basis).

WRITER

Areas of interest – Linguistics, Languages, Ancient History, Indus civilization, and Indian Diaspora.

PUBLICATIONS

Several papers for professional journals.

Chief author of a column on family and youth issues for two Indian weekly papers.

AUTHORED TWO BOOKS:

America and India: In a 'Give & Take' Relationship (2003).

5000 Years of Sindhis: Heritage, Religion, Entrepreneurship, Sindhyat and Language (2006).

Working on two more – Ancient India, and Global Indians

CHIEF EDITOR OF TWO BOOKS

Global Indian Migration (1989),

Global Indian Diaspora: Yesterday, Today and Tomorrow (1993).

COMMUNITY ACTIVIST

Co-founder of the India Day Parade, New York.

Marshal, First India Day Parade (1981) in New York

Co-founder of GOPIO (Global Organization of People of Indian Origin).

As the representative of the Asian Indians in the USA, **appeared before the US Senate Sub-Committee** on March 23, 1987 to protest against the proposed American sale of AWACKs to Pakistan. Pakistan did not get AWACs

Has visited over 21 countries and met with Indian communities.

Moderated International Conference on 'Changing Role of Indian Women Worldwide' (Mumbai, 1997).

Has organized and moderated several NFIA family conferences in the USA.

Muralidhar Pahoja Ph.D

Date of Birth: April 14, 1940

Expertise: Theoretical & Applied Mechanics.

Retired (1998) as Head IT applications in Engg.

Experience: (Retired since 1998)

1. (1981-1998) Escorts Research Centre, Faridabad.

Head, IT Applications.

2. (1972- 1981) Indian Institute of Technology, Kharagpur and Delhi.

Teaching & Research in Tractor, Farm Machinery, Applied Mechanics,

Academic:

(1972) Ph.D. Theoretical & Applied Mechanics, University of Illinois, USA.

Specialisation: Computer Applications.

1966) M.S. Agricultural Engineering, University of Illinois, USA.

Specialisation: Tractors & Farm Machinery.

(1963) B.Tech.(Hons.) Agricultural Engineering, I.I.T., Kharagpur.

Joginder Singh

IPS (Retd.) Former Director, CBI,

India

123-124, Nav Sansad Vihar, CGHS, Sector 22,

Plot Number 4, Dwarka, New Delhi 110075

Telephone; 28052742,

Number and Address, in Punjab Jalalabad (west) District;

Ferozpore, Pin code; 152024, Email; jogindersinghfdips@hotmail.com

David Frawley PhD (Pandit Vamadeva Shastri)

Dr. David Frawley (Pandit Vamadeva Shastri) has written over thirty books on Vedic subjects over the past thirty years, including six titles on ancient India. Most recent is Hidden Horizons: Unearthing 10,000 Years of Indian Culture, published by the Swaminarayan order (BAPS) in India. He is the director of the American Institute of Vedic Studies in Santa Fe, New Mexico (www.vedanet.com), which offers courses on Ayurveda, Yoga, Vedic astrology and Vedic studies. Vamadeva has also written several books on Hindu Dharma and the contemporary challenges facing it.

Om Prakash

Lecturer in History

School of Policy Sciences

National Law University, NH-65, Nagaur Road

Mandore, Jodhpur , Rajasthan, India

Ph: 91-09461030615

Fax: 91-0291-2577540

Stephen Knapp

Stephen Knapp is an author of numerous works, largely dealing with theories regarding the history of ancient India. As a member of the International Society for Krishna Consciousness he studied under the direction of the movements founder, A. C. Bhaktivedanta Swami Prabhupada who gave Stephen the name *Nandanandana dasa* upon initiation. He is president of the "Vedic Friends Association" [1] and is a supporter of the Out of India theory

Publications

The Secret Teachings of the Vedas

The Universal Path to Enlightenment

The Vedic Prophecies: A New Look into the Future

How the Universe was Created and Our Purpose In It

Toward World Peace: Seeing the Unity Between Us All

The Key to Real Happiness

Michel Danino

Born in 1956 at Honfleur (France) into a Jewish family recently emigrated from Morocco, from the age of fifteen Michel Danino was drawn to India, some of her great yogis, and soon to Sri Aurobindo and Mother and their view of evolution which gives a new meaning to our existence on this earth. In 1977, dissatisfied after four years of higher scientific studies, he left France for India, where he has since been living.

Michel Danino participated in the English translation and publication of ***Mothers Agenda*** (13 volumes, Mothers record of her yoga in the depths of the body consciousness) and several books by Satprem (Mothers confidant and recipient of *Mothers Agenda*). Michel Danino also edited, among other titles, ***Indias Rebirth*** (a selection from Sri Aurobindos works about India, available online; first published in 1993, now in its 3rd edition, translated into nine Indian languages) and ***India the Mother*** (a selection from Mothers words, 1998).

In 2001, Michel Danino convened the International Forum for India's Heritage (IFIH) with over 160 eminent founder members, whose mission is to promote the essential values of India's heritage in every field of life.

Publications

Sri Aurobindo and Indian Civilization (1999)

The Invasion that Never Was (2000)

The Indian Mind Then and Now (2000)

Is Indian Culture Obsolete (2000)

Kali Yuga or the Age of Confusion (2001)

L'Inde et l'invasion de nulle part - Le dernier repaire du mythe aryen (2006) Les Belles Lettres. ISBN 2-251-72010-3

Michel Danino

80 Swarnambika Layout

Ramnagar

Coimbatore – 641 009

(Tamil Nadu) India

Tel: 91-422-6451096

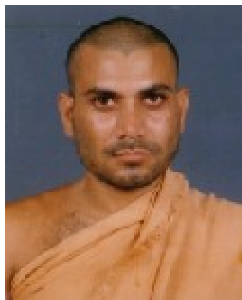
Email: micheld@sify.com

michel_danino@yahoo.com

T Hanuman Chowdary PhD

Director : Center for Telecom Management & Studies
Chairman : Pragna Bharati, Andhra Pradesh
Fellow: Tata Consultancy Services & Satyam Computer Services
Former: Information Technology Advisor: Government of Andhra Pradesh
Chairman & Managing Director, Videsh Sanchar Nigam Ltd
Plot No. 8, P&T Colony, Karkhana (Secunderabad), Hyderabad - 500 009.
Phone : +91 (40) 2784-6137,6667-1191 (Off) & 2784-3121 (Res)
Fax : +91 (40) 6667-1111, 2789-6103 (Off)
E-Mail: hanuman.chowdary@tcs.com & thc@satyam.com

Swami Vigyananand



Swami Vigyananand, a Bachelor in Technology from IIT, Kharagpur, India. A Vidyavaridhi (Similar to Ph.D) in Oriental Philosophy which includes six school of Hindu Philosophy (Upang) along with Buddhist, Jain, Atheist Philosophy and other Hindu school of Philosophy and Vachaspathi (Similar to D.Lit) Brahmana and Vedic Samhita. He has also published

several books including the Bibliography of Sanskrit Grammer; (Sanskrit Research Book). Currently he is the Coordinator for Asia and Pacific Zones of Vishwa Hindu Parishad (World Hindu Council).

M. A. Jayashree PhD



Dr. M. A. Jayashree, Professor of Sanskrit, is an ardent believer of value system of education and as such is following the traditional Indian system of teaching Sanskrit, Sastra-s and Music through the age old Srutiparampara path. She has many CD's to her credit in the field of Veda-s, Yoga Sutra-s, Sloka-s and Sanskrit Verses. She has been trained in the traditional way of chanting the Vedas and the Upanishads. She has a doctorate in Sanskrit under the guidance of Prof. K. T. Pandurangi on "The concept of Mind in Indian Philosophy ", a Vidwat in music and hails from a family of traditional scholars. She has a melodious voice, diligent diction and clear conception. She is one of the editors to the journal Ithihasa Rashmi.

CD's with books made under the project Sruti pramapara so far

1. Sabda-Dhatu Manjari-- Declensions & Conjugations – Anuvacanam & Vaacanam (Both call & response method and Chanting).

2. The Prajnaparamita Sutra or the Heart Sutra of Bhagawan Buddha- Anuvacanam & Vaacanam (Both call & response method and Chanting).

3. Hathayogapradipika Of Yogi Svatmarama

4.Yoga sutrani of Maharsi Patanjali and other stotras, subhasitas.

5. Ubhayaveda—chanting of the Tiruppavai (Tamil Veda), Mukundamala of Kulashekhara Alvar and some devotional scriptures of Bhagawan Ramanujacarya - Anuvacanam & Vaacanam (Both call & response method and Chanting).

6. Sanatna vignana taranga – an eleven lecture series in Kannada on ancient sciences of India (mainly in the Vedas and the Upanishads).

M.A.Narasimhan



Sri. M. A. Narasimhan, Director, Anantha Research Foundation, Mysore, is a science graduate holding Masters Degrees in Education and Sanskrit and a yoga practitioner. He is a teacher of Transcendental Meditation and a research scholar specializing in the field of Indian culture and the Sciences of ancient India. He has books, monographs, and papers in the field of Indian history, Science, Sanskrit and philosophy to his credit. He is one of the editors to journals like Ithihasa samachar, Ithihasa Rashmi, and Tattvadipa.

Edited: Science and technology in India through the ages.

1. Currently engaged in producing a critical edition of 'Patanjala yoga sutra' with all the traditional commentaries with meaning in English with ACIP New York.

2. Working with Indian National Science Academy on "Supasatra in Indian tradition".

(2784 words)

Appendix B

Proposed Skeleton or Scaffolding of Indian Chronology

Key Dates

Event	Individual or detailed description	Date
Era	The Vedic Era	7000 to 4000 BCE
Sarasvati Sindhu Civilization	Mehrgarh Culture, early phase	7000 BCE
Era	Brahmana Era, Beginning of	5000 BCE
Era	Puranic Era	5000 BCE – 3000 BCE
Birth	Veda Vyaasa	3200~3300 BCE
Vernal Equinox in Rohini	Observation of Nakshatra in which the Vernal Equinox occurs	~3100 BCE
War	The Great Bharata War	Nov 22, 3067 BCE
Era	Era of the Sulva Sutras. Sutras of the cord, development of geometry, trigonometry	4000 ~2000 BCE
Birth	Apastambha	~3000 BCE
Birth	Baudhayana	~3000 BCE
Era	Kali Yuga	3102 BCE
Writings	Pingala	2900 BCE
Writings	Panini's Ashtadhyayi, codification of Vyakarana and other Vedangas	2900 BCE
Paradigm shift	Use of Decimal Place Value system (Panini , Pingala). Catalyzed Indic contributions to algebra, number theory, infinite series,spherical trigonometry	2900 BCE

Sarasvati Sindhu civilization	Mature Phase	3000 BCE – 1700 BCE
Dynasty (Magadha)	Brhihadratha Dynasty (22 kings, 1007 years)	3139 BCE- 2132 BCE
Birth	Aryabhata	2765 BCE ,337 Yugabda
Writings	Yajnavalkya, Brihat-Aranyaka Upanishad,Satpatha Brahmana	~3000 BCE Astronomical evidence
Writings	Aryabhata wrote the Aryabhatiyum when he was 23 years old	2742 BCE
Dynasty	Pradhyota Dynasty (5 kings, 138 years)	2132 to 1994 BCE
Dynasty	Sisunaga Dynasty (10 kings ,360 years)	1994- 1634 BCE
Lifespan	Gautama Buddha	1887-1807 BCE ,puranic and astronomical evidence
Dynasty	Nanda Dynasty (Mahapdmananda and his sons)	1634 – 1534 BCE
Coronation	Chandragupta Maurya	1534 BCE -1500 BCE
Coronation	Asoka Maurya	1472 BCE
Dynasty	Maurya (12 kings ,316 years	1534-1218 BCE
	Kushan Empire	1298 BCE -
Dynasty	Sunga Dynasty (10 kings, 300 years)	1218 – 918 BCE
Writings	Patanjali's Mahabhashya	1218 BCE
Writings	Nagarjuna	1294 BCE
Reign	Kanishka	1298-1237 BCE
Dynasty	Kanva Dynasty (4 kings,85 years)	918-833 BCE
Era	Andhra Satavahana (32 kings , 506 years)	833 BCE -327 BCE
Birth	Kumarila Bhatta	557 BCE
Era	Sakanripa Kala (era of Cyrus the great of Persia	550 BCE
Birth	Adi Sankaracharya	509 BCE-477 BCE

Coronation	Alexander of Macedonia	336 BCE
Coronation	Chandragupta of Gupta dynasty	327 BCE
War	Alexander initiates an inconclusive battle with Purushottam, regional kshatrap in the Punjab and is forced to retreat short of his goal of vanquishing the great empire of India	326 BCE
Dynasty	Imperial Gupta Dynasty (7 kings, 245 years)	327 BCE- 82 BCE
Pancha Siddhanta	VarahaMihira	123 BCE
Reign	Vikramaditya	102 BCE to 78 BCE
Era	Vikrama Saka	57 BCE
Birth	Brahmagupta	30 BCE
Era	Salivahana Calendar(Punwar dynasty)	78 CE
Writings	Bhaskara II Siddhanta Siromani	486 CE
Dynasty	Punwar Dynasty (23 Kings,1111 years)	82 BCE- 1193 CE
Era	Christian Era	0 (Yugabda 3102)
Era	Salivahana (Saka Calendar)	78 CE
Dynasty	Pala Empire	750-1174 CE
Dynasty	Chola Empire	848 CE – 1279 CE
Beginning of Islamic Era	Prithviraj Chamahana the last major indic dynasty in North india	1192 CE
Era	Delhi Sultanate	1192 CE – 1526 CE
Era	The Hoysalas	1040 CE–1346 CE
Reconquista begins and the Fall of Toledo t	Toledo, the great Muslim center of learning	1085 CE

	falls into Christian hands	
Era	**The Kakatiyas**	**1083 CE–1323 CE**
Era	**Bahmani Confederation**	**1390 CE - 1596 CE**
Era	**Vijayanagar Empire**	**1339 CE - 1625 CE**
Era	**The Moghal Empire**	**1526 CE – 1757 CE**
Dynasty	**The Maratha Confederacy**	**1674 CE - 1818 CE**
Dynasty	**The Sikh Confederacy**	**1716 CE – 1849 CE**
Dynasty	**The British Empire**	**1757 CE – 1947 CE**
Era	**The Modern Republic**	**1950 CE**

(557 words)





Appendix C Timeline of Ancient Greece with bookmarks from Persia, India

(all dates are BCE unless stated otherwise)

Gregorian Year BCE	Greece
7000-3300	**Neolithic Period**
3300-1050	**Bronze Age**
2200-1500	Minoan palaces established on Crete
1600	rise of Mycenaeans
1450	Mycenaeans conquered Crete
1400-1200	beads and ornaments made out of glass by Mycenaeans
1200-1000	Dorians invaded Greek mainland
1184	traditional date for the destruction of Troy
1066	position of Archon replaced the king in Athens
1050-750	**Greek Dark Age**
900	founding of Sparta
875-750	geometric period in pottery
776	first Olympic Games
753	traditional date for the founding of Rome
752	archon position limited to ten years in Athens
750-500	**Archaic Age**
730-710	Spartans conquered Messenia
683	archon position in Athens changed from one to nine, elected every year
669	Sparta defeated by Argos
	HAXAMANISH or ACHAEMENES, first King of Persia, was mythical. **TEISPES** c. 7th century BC. **KURASH I** (or CYRUS I) c. late 7th Century BC, son of Teispes. **ARIARAMNES** c. late 7th century BC, son of Teispes.

	KAMBUJIA I (or CAMBYSES I) ? - 559 BC, son of Kurash I. **KURASH II** (or CYRUS II) 559 - c. 550 BC when he became King of Kings, son of Kambuyia I.
650	first life-size marble statue created
650-600	first bronze statues made by lost wax method
620	Draco's harsh laws instituted in Athens
594	Solon became archon and began democratic reforms in Athens
560	Peisistratus's tyranny begins in Athens
478	Delian League under Athenian leadership formed
476	naval campaign by Cimon began for Athens and continued for next three years
471	Themistocles ostracized from Athens
467	Persians defeated by Cimon
463	Cimon prosecuted by Pericles, but acquitted in Athens
462	democratic reforms by Pericles in Athens
461	Cimon ostracized from Athens
460-446	first Peloponnesian War
458-456	Long Wall built connecting Athens to port city of Piraeus
454	treasury of Delian League moved from Delos to Athens
451	Five-year peace treaty between Sparta and Athens Perciles changed Athens law on citizenship
447-432	Athens began to rebuild Acropolis including the Parthenon
431-404	second Peloponnesian War
430	plague in Athens
429	death of Pericles
405	Athenian navy badly defeated by Lysander at battle of Aegospotami
404	surrender of Athens Oligarchy of Thirty appointed by Sparta (nicknamed the "Thirty Tyrants")
403	fall of Thirty Tyrants democracy returned to Athens
399	Socrates condemned to death
387	Plato founded Academy in Athens
359	Phillip II became king of Macedonia
358-336	Phillip's empire expanded into other territories and defeated Greek city-state
336	Darayavahyush (Greek Darius III)became king of Persia
336	Phillip II assassinated; Alexander the Great took over throne
335	Aristotle founded school in Athens
334	Alexander defeated Persians at Granicus River
333	Alexander defeated Darius III and Persians at Issus

332	Alexander entered Egypt
331	Alexander established Alexandria
331	Alexander defeated Darius III and Persians at Gaugamela
326	Alexander battled Purushottam inconclusively,Regional Kshatrapy of Punjab at Hyphasis River in India The last of the Satavahanas is ruling India Alexander's army refused to go further into India Alexander's army turned back west to travel home
322	Alexander died
323-30	**Hellenistic Period**
306	Antigonus, Ptolemy, and Seleucus I proclaimed themselves kings over areas of Alexander's empire
250 – 200	Archimedes screw invented
200	screw press for pressing olives and grapes invented
146	parts of Greece became part of Roman Empire
30	all of Greece became part of Roman Empire

Appendix D Select Dynasties who ruled India in the 'Modern' era after the start of Kali Yuga February 17, 3102 BCE

There is no attempt at completeness here and this list or lists are not exhaustive by any means. But the dynastic lists available to us are far more complete, than our English Language text books would have you believe. So when Indian History Books written by Englishmen, studiously avoid mentioning dynastic lists, methinks they have a reason and that being the need to indulge in and foster the illusion that the Indic had no sense of history. Our response is what is the gold standard for the respective eras we are talking about? How many accurate Dynastic lists do we have in the world going back to to 3000 BCE and earlier?

Descendants of the Kuru Pandavas (from Yudhistira 3067 BCE – 1634 BCE)

Yudhistira
Parikshit
Janamejaya
Sataneeka
Ashwamedadata
Adhseema Krishna
Nichaknu
Ushna
Chitra ratha
Suchirata
Krushnimanta
Sushena
Suneetha
Nrupegakshu
Sukhibala
Pariplava
Sumaya
Medhavi
Ripunjaya
Urva
Tigma
Bruhadradha
Ripunjaya
Urva
Tigma
Bruhadradha
Ripunjaya
Urva
Tigma
Bruhadradha

Chart I : INDUS - SARASWATI CIVILIZATION : STAGES OF DEVELOPEMENT (4000 B.C. - 1500 B.C.)

PERIOD	APPROXIMATE TIME BRACKET	REGION AND CULTURES					
		PUNJAB	SINDH	RAJASTHAN	HARYANA	GUJARAT	BALUCHISTAN
LATE PERIOD	1500 B.C. To 1900 B.C.	Cemetery - H	Jhukar	Kudwala Lurewala Gamanwala Siddhuwala Shahiwala	Mitathal - I I B Bhagwanpura - I B - Sanghol - I	Dholavira - V I Kuntasi - I.I Surkotada - I C Rojdi Lothal B	Mehargarh -V I I I Sibri
MATURE PERIOD	1900 B.C. To 2600 B.C.	Harappa - I I I C B A	Mohenjodaro (Upper Levels) Balakot - I I	Kalibangan - I I Ganeshwar - I I	Banawali - I I Kunal I C	Dholavira - I V Kuntasi - I Surkotada I A - I B Padri I I Rojdi Lothal A	Nausharo - I I
TRANSITION PERIOD	2600 B.C. To 2800 B.C.	Harappa - I I	Mohenjodaro (Intermediate Levels) Balakot - I I (Lower Levels)	Kalibangan (I - I I Overlap)	Banawali - I C Kunal I B (Upper Level)	Dholavira - I I I Surkotada - I A (Lower Levels)	Nausharo - I I - I C
EARLY PERIOD	2800 B.C. To 3500 B.C.	Kot Diji - I Harappa-I	Kot Diji - I Mohenjodaro (Lower Levels) (Pre-Defence)	Kot Diji - I Kalibangan - I Ganeshwar - I Sothi Culture	Kunal I B Kot Diji Banawali I A - I B	Dholavira - I - I I Padri - I	Mehargarh - V - VII Nausharo I A & B
FORMATIVE PERIOD	3500 B.C. To 4000 + B.C.	Pre-Harappa - I " Ravi Culture " (Pre -Kot Diji) Level Jalilpur - I	Amri Culture Miri Kalat - I I Bala Kot - I	Hakra Culture Lathwala - I Bhostanwala Ambrawali Chikrala	Kunal Culture Kunal - I A	Padri I Loteshwar	Mehargarh - I V - V

From Dating in Indian Archaeology,Problems and Perspectives, Bharatiya Itihaas Sankalan Samiti, T P Verma Ed.

(579 words)

Kasudana
Saranika II
Udayana
Kihinara
Dandapani
Nivamitra
Kshemaka

Dynastic Lists of the Magadha Empires

Dynasty	Number of Kings	Period	Total number of years ruled	Cumulative total
Brhadratha	22	3136 to 2132 BCE	1006	
Pradhyota	5	2132 to 1994 BCE	138	1144
Sisunaga	10	1994 to 1634 BCE	360	1504
Nanda	9	1634 to 1534 BCE	100	1604
Maurya	12	1534 to 1218 BCE	316	1920
Sunga	10	1218 to 918 BCE	300	2220
Kunwa	4	918 to 833 BCE	85	2305
Andhra Satavahana	33	833 to 327 BCE	506	2811
Imperial Gupta	77	327 to 82 BCE	245	3055
Punwar or Pramara	24	82 BCE to 1193 CE	1275	4330
Totals	206	3136 BCE to 1193 CE	4330	

The Brihadratha Dynasty

Serial no.	Name of King	Regnal Period	Begins Kali Era KE or Yugabda	Begins BCE
1	Marjari	58	36 before KE	3138
2	Srutasrava	64	22	3080
3	Apratipa or Ayutayu	36	86	3016

4	Niramitra	40	122	2980
5	Sukrutha or Sukshatra	58	162	2940
6	Brihatkarma	23	220	2882
7	Syenajit	50	243	2859
8	Srutanjaya	40	293	2809
9	Mahabala or Vibhau	35	333	2769
10	Suchi	58	368	2734
11	Kshemya	28	426	2676
12	Anuvrata or Suvrata	64	454	2648
13	Dharmanetra or Sunetra	35	518	2584
14	Nirvriti	58	553	2549
15	Suvrata	38	611	2491
16	Dhrudasena or Mahasena	58	649	2453
17	Sumati or Mahanetra	33	707	2395
18	Suchala or Subala	22	740	2362
19	Sunetra	40	762	2340
20	Satyajit	83	802	2300
21	Veerajit or Viiswajit	35	885	2217
22	Ripunjaya	50	920	2182

The Pradyota Dynasty

Serial no.	Name of King	Regnal Period	Begins Kali Era KE or Yugabda	Begins BCE
1	Pradyota or Balaka	23	970	2132
2	Palaaka or Paalaka	24	993	2109
3	Visakhayupa	50	1017	2085
4	Jamaka or Suryaka	21	1067	2035
5	Nanivardhana	20	1088	2014

The Sisunaga Dynasty

Serial no.	Name of King	Regnal Period,years	Begins Kali Era KE or Yugabda	Begins BCE
1	**Sisunaga**	**40**	**1108**	**1994**
2	**Kakavarma**	**36**	**1148**	**1954**
3	**Kshemadharma or Kshemavarma**	**26**	**1184**	**1918**
4	**Kshemajit**	**40**	**1210**	**1892**
5	**Vidhisarta or Bimbisara**	**38**	**1250**	**1852**
6	**Ajatasatru**	**27**	**1288**	**1814**
7	**Darsaka or Vamsaka**	**35**	**1315**	**1787**
8	**Udayana or Udasina**	**33**	**1350**	**1752**
9	**Nandivardhana or kakavardhana**	**42**	**1383**	**1719**
10	**Mahanandi**	**43**	**1425**	**1677**

The Nanda Dynasty

	Name of King	Regnal Period,years	Begins Kali Era KE or Yugabda	Begins BCE
1	Mahapadmananda	88	1468	1634
2	Sumalya etc, 9 brothers	12	1556	1546

The Maurya Dynasty

Serial no.	Name of King	Regnal Period,years	Begins Kali Era KE or Yugabda	Begins BCE
1	Chandragupta Maurya	34	1568	1534
2	Bindusara	28	1602	1500
3	Asoka	36	1630	1472
4	Suparsva or Suyasa	8	1666	1436
5	Dasaradha or Bandupalita	8	1674	1428
6	Indrapalita	70	1682	1420
7	Harshavardhana	8	1752	1350
8	Sangata	9	1760	1342
9	Salisuka	13	1769	1333
10	Somasarma or Devasarma	7	1782	1320
11	Satadhanva	8	1789	1313
12	Brihadradha orBrihadaswa	87	1797	1305

The Sunga Dynasty

Serial no.	Name of King	Regnal Period,years	Begins Kali Era KE or Yugabda	Begins BCE
1	Pushyamitra	60	1884	1218
2	Agnimitra	50	1944	1158
3	Vasumitra	36	1994	1108
4	Sujyeshta	17	2030	1072
5	Bhadraja or Andhraka	30	2047	1055
6	Pulindaka	33	2077	1025
7	Ghoshavasu	3	2110	992
8	Vajramitra	29	2113	989
9	Bhagavata	32	2142	960
10	Devabhuti Kshemabhumi	10	2174	928

The Kanva Dynasty

	Name of King	Regnal Period,years	Begins Kali Era KE or Yugabda	Begins BCE
1	Vasudeva Kanva	30	2184	918
2	Bhumimitra	24	2223	879
3	Narayana Kanva	12	2247	855
4	Susarma	10	2259	843

The Satavahana Andhra Dynasty

S.No	Name of the King	Regnal Period,years	Period of Reign in Kali era (solar tropical year)	Period of reign BCE (before the common era)
1	Simukha Saatakarni	23	2269-2292	833 - 810
2	Sri Krishna Saatakarni	18	2292- 2310	810-792
3	Sri Malia Saatakarni	10	2310 - 2320	792 - 782
4	Puurnothsanga	18	2320 - 2338	782-764
5	Sri Satakarni	56	2338 - 2394	764 - 708
6	Skandha stambhi	18	2394 - 2412	708 - 690
7	Lambodara Saatavaahana	18	2412 - 2430	690 - 672
8	Apiitaka Saatavaahana	12	2430 - 2442	672 - 690
9	Meghaswaati Saatavaahana	18	2442 - 2460	660 - 642
10	Saata Swaati Saatavaahana	18	2460 - 2478	642 - 624

11	**Skanea Saatakarni**	**7**	**2748-2485**	**624-617**
12	**Mrigendra Saatakarni**	**3**	**2485 - 2488**	**617 - 614**
13	**Kuntala Saatakarni**	**8**	**2488 - 2496**	**614 - 606**
14	**Soumya Satakarni**	**12**	**2496-2508**	**606-594**
15	**Saata Saatakarni**	**1**	**2508 - 2509**	**594 - 593**
16	**Puloma or Puloma I**	**36**	**2509 - 2545**	**593 - 557**
17	**Megha Satakarni**	**38**	**2545 - 2583**	**557 - 519**
18	**Arishta Satakarni (in the tenth year of his reign in B.C. 509, Sri Sankara was born.)**	**25**	**2583 - 2608**	**519 - 494**
19	**Haala Saatavahana**	**5**	**2608 - 2613**	**494 - 489**
20	**Mandalaka Saatavahana**	**5**	**2613 - 2618**	**489 - 484**
21	**Purindrasena Saatavahana**	**21**	**2618 - 2639**	**484 - 463**
22	**Sundara Saatakarni**	**1**	**2639 - 2640**	**463 - 462**
23	**Chakora Saatakarni**	**1/2**	**2640 2640**	**462-461**

	Mahendra Saatakarni	**1/2**	**2641 - 2641**	**462-461**
24	**Siva Saatakarni**	**28**	**2641 - 2669**	**461-.433**
25	**Gautamiputra Saatkarni**	**25**	**2669-2694**	**433-408**
26	**II Puloma Saatakarni**	**3**	**2694-2726**	**408-376**
27	**Siva sri Saatakarni**	**7**	**2726-2733**	**576-369**
28	**Sivaskanda Saatakarni**	**28**	**2733-2740**	**369-342**
29	**Yajna Sri Saatakarni**	**19**	**2741-2759**	**362-343**
30	**Vijayasri Saatakarni**	**6**	**2759- 2765**	**343-337**
31	**Chandra Sri Saatakarni**	**3**	**2765-2768**	**337-334**
32	**III Puloma Sri Saatakarni**	**7**	**2768-2775**	**334 - 327**

The Imperial Gupta Dynasty

Serial no.	Name of King	Regnal Period	Begins Kali Era KE or Yugabda	Begins BCE
1	Chandragupta I or Vijayaditya	7	2775	327
2	Samudragupta or Asokaditya	51	2782	320
3	Chandragupta II or Vikramaditya	36	2833	269
4	Kumaragupta I or Mahendraaditya	42	2869	233
5	Skandagupta or Pratapaditya	25	2911	191
6	Narasimha gupta Baladitya	5 35	2936 2941	166 161
7	Kumaragupta II Kramaditya	44	2976	126

Source: Chronology of Ancient Hindu History Part 1. author and publisher ¡§ Bharata Charitra Bhaskara¡¨,¡§Vimarsakagresara¡¨

Pandit Kota Vankatachela paakayaaji Kali 5058, AD 1957- Arya vignana Grantha Mala , Publication No 23

The List of Chola Kings[126]

Early Cholas, Interregnum (circa 200-848 CE)

Ilamcetcenni · Karikala Chola, Nedunkilli · Nalankilli

Killivalavan · Kopperuncholan, Kocengannan · Perunarkilli

Medieval Cholas	
Name	**Regnal Period,CE**
Vijayalaya Chola	**848-871(?)**
Aditya I	**871-907**
Parantaka Chola I	**907-950**
Gandaraditya	**950-957**
Arinjaya Chola	**956-957**
Sundara Chola	**957-970**
Uttama Chola	**970-985**
Rajaraja Chola I	**985-1014**
Rajendra Chola I	**1012-1044**
Rajadhiraja Chola	**1018-1054**
Rajendra Chola II	**1051-1063**
Virarajendra Chola	**1063-1070**
Athirajendra Chola	**1067-1070**
Chalukya Cholas	
Kulothunga Chola I	**1070-1120**
Vikrama Chola	**1118-1135**
Kulothunga Chola II	**1133-1150**
Rajaraja Chola II	**1146-1163**
Rajadhiraja Chola II	**1163-1178**
Kulothunga Chola III	**1178-1218**
Rajaraja Chola III	**1216-1256**
Rajendra Chola III	**1246-1279**

[126] Dating and dynastic lists need to be examined

The Dynastic list of the Vijayanagar Empire (1336 - 1672 CE)

1 Vira Harihara I Sangamas 1336 (CE unless otherwise noted)	**1354 2 Bukka Raya I Sangamas 1354**	**1377 3 Vira Harihara Raya II Sangamas 1376**	**1404 4 Virupaksha Raya I Sangamas 1404**
1405 5 Bukka Raya II Sangamas 1405	**1406 6 Deva Raya I Sangamas 1406**	**1422 7 Bukka Raya III Sangamas 1422**	**1423 8 Deva Raya II Sangamas 1423**
1446 9 Vira Deva Raya Sangamas 1446	**1447 10 Mallikarjuna Raya Sangamas 1447**	**1465 11 Virupaksha Raya II Sangamas 1465**	**1486 12 Suluva Narasinga Raya I Suluva 1486**
1493 13 Suluva Narasinga Raya II Suluva 1493	**1501 14 Vira Narasimha Raya I Tuluva 1501**	**1502 15 Vira Narasimha Raya II Tuluva 1502**	**1509 16 Krishna Deva Raya Tuluva 1509**
1530 17 Achyuta Deva Raya Tuluva 1530	**1542 18 Venkata Deva Raya I Tuluva 1542**	**1543 19 Vira Sadashiva Raya Tuluva 1543**	**1568 20 Tirumala Deva Raya II Aravidu 1568**
1572 21 Sri Ranga Deva Raya I Aravidu 1572	**1586 22 Venkatapati Deva Raya II Aravidu 1586**	**1614 23 Sri Ranga Deva Raya II Aravidu 1614**	**1615 24 Rama Deva Raya Aravidu 1615**
1633 25 Venkata Deva Raya III Aravidu 1633	**1646 26 Sri Ranga Deva Raya III Aravidu 1646**	**1672**	

The Vijayanagar Empire was the last of the major Hindu Kingdoms

The Satavahana Andhras

The Satavahana Andhras

Ed.Note

The history of the Andhra Kingdoms has been much neglected in the Eurocentric descriptions of our past. Furthermore , there has been an assumption that Andhra has been synonymous with the Telugu language. While the Telugu language has an extensive literature of its own , our current knowledge of the matter suggests that the Andhra Kingdoms predate the language by at least a millennium. Here is one account of the history of the Andhras. To verify this chronology we need to cross check references to Adi Sankara during this period.

The Andhra Dynasty of Emperors of Magadha

506 (Total Years of the Satavahana Dynasty)

As per the list above the 32 Andhra Satavahana emperors of Magadha ruled for 506 years on the whole from Kali2269 - 2775 or B. C. 833 to 327 B. C. After them the founder of the Gupta or Andhra Bhritya Dynasty. Chandragupta occupied the throne in B. C. 327 after putting to the sword the last two princes of the Aandhra dynasty, Chandra Sri and Puloma III. The king who then got himself crowned at Pataliputra, having annexed a considerable part of the Magadha state was this Chandragupta 1 of the Gupta dynasty and not Chandragupta Maurya, founder of the Maurya dynasty, as' is commonly and erroneously supposed now-a-days, By this erroneous identification by the western (European) historians of India, and as a consequence of it to be in accord with that. By pushing forward and locating in B. C. 1500 the Mahabharata war which took place actually in B. C 3138 and the coronation of Chandra Gupta Maurya of B. C. 1534 to B. C, 324. The antiquity of the entire history of ancient India has been reduced by more than 12 centuries.

Details of this distortion (partly due to mistake and partly to deliberate mischief) are given in our other publication in English with the title 'The plot in Indian Chronology'. In B, C. 327 the Aandhras lost their power in the Magadha state, the Paramount power In Bharat at the time. Their empire came to an end; but not the Saatavahana dynasty of Aandhra princes. The princes of the dynasty indulged in mutual quarrels, cut up the empire into bits, each declared himself independent and all reduced themselves to the position and status of rules of petty principalities. The royal dynasty split up into 12 branches according to the Puranas.

Aandhraram samsthitaha panch tesham vasashcah ye punaha saptaivatu bhavisyanti iti (Brahmanda Purana Chap 77, Verse 171 or Vayu Purana Ghapt. 99-3517- Verse.

)

Thereafter the princes of the Agni dynasty (a branch of the Saatavahana dynasty) might have branched off into various further subdivisions. Pallava, Cheta, Sena. Kadamba, Rashtrakuta, Vishnulu Kundina. Brihatphalayana, Baana. Gaanga, Hosala, Rajaputra, Saalamkayana, Vakataka. Vallabhi. Vaidumba, Nolamba dynasties were all connected with the Andhra Saatavahana dynasty' Even from earlier times as the eldest sons at. The Saatavahana kings only succeeded to the throne by the principle of Primogeniture, the younger sons and sons in law of the

kings of the different generations were perhaps provided for by being made the chiefs of small principalities in Rajputana (current day Rajastyhan.

The present Rajput royal dynasties might have thus come into being. Such as Pramara or Paramara Chapahani or Chahuman. Sukla or Chalukya, Parihara or pratihara) the four Agni dynastieg. These royal dynasties are otherwise known as Brahma-Kshatriyas, as the founders of the above named four dynasties were all Brahmanas well versed in the Vedas.

The Bhavishya Purana-Pratisarga parva declares Pramara was a student of Saama. Chapahaani of Yajus. Sukla was versed in the three Vedas (Rig, Yajus and Sarna) and Parihara was a student of Adharvana. In Kali 2710. ie. B. C. 392, these four scholar s and sages were made to perform sacrifices on Mount Arbuda or Abu in Raajaputana, with the object of developing in them the martial spirit (Kshatra Tejas) and they were made the kings of the four parts of the country. Details of this account of the origin of the royal families of the Agni dynasty are available in the last chapter of this book "Kings of Agni Vamsa".

Kalhana in his Raja tharangini says Princes descended from the Andhra Saatavahana dynasty were ruling in the eighth century after Christ, in Kashmir. Lahore, Abhisaara, Draga, Simhapura, Divyakataka, Uttara Jyotisha, - the first two now forming part of Kashmir and the last three in modern Afghanistan, all the five, Yavana kshatriya kingdoms. The Lohaar and Hindu Saahi princes are descendents of the Andhra Saatavahana and the Thomara dynasty derived from it. The famous emperors Vikrarnaditya, Saalivahana and Bhoja belonged to the Pramara or Paramara or more well known as Panwar dynasty deriving from the Andhra Saatavahanas. The Chapahanis were also known as Chahumans, those of the Thomara branches followed the Kshatriya, traditions and customs and were reckoned as Kshatriyas proper in the Puranas too. The famous historical personages Prithviraj, Jayachand and Rani Samyukta all belong to the Thomara dynasty.

The Sukla or Chalukya princes are well-known among the rulers of Southern India. Of them one branch known as the Eastern Chalukya ruled over the regions of the eastern coast land and another known as the Western Chalukya ruled in the west. The famous king Raja Rajanarendra, who patronized and sponsored the literary effort of the translation of the Mahabharata into Telugu, belonged to the Eastern Chalukya dynasty. During the centuries after Christ, the Chalukya princes deemed it more honorable to style themselves as Kshatriyas and managed to link up the founders of their dynasties with ancient Kshatriya princes and got such lists of their descent recorded in the inscriptions of their times. The Pariharas ruled in Bengal the Brahmanas of the Sakti worship cult in Bengal belong to this branch of Agni Kshatriyas or Brahma-Kshatras.

The kings of the Kadamba Dynasty.

Mayuura Sarma, founder of the Kadamba dynasty of princes who ruled in Kerala or Malayala country, also belonged to the Aandhra Saatavahana dynasty and became the ruler of that part of the country in the 6th century B. C. Kaakutsa Varma a prince of this dynasty was ruling there in B. C. 550 (Vide Ancient Dekkan P. 27)

As there were no Brahmanas in Kerala at that time king 'Mayuura sarma' sponsored the migration of a group of Brahmana families from his birth place Ahi kshetra [Sarpavaram as it is now called) a village in Godavari District and settled them in his kingdom. In the 'South Indian castes And Sects' a publication of the Madras Government in seven volumes, it is stated with reference to the Brahmanas of Kerala : -- ¡§In some of the ancient texts of Brahmanas in manuscript, it is recorded that, in the reign of king Mayuravarma of the Kadamba dynasty, some Aandhra Brahmanas were encouraged to migrate to south Kanara. Subsequently the legendary curse of

Parasurama till this migration of Brahmanas from Ahi kshetra in Aandhra under the patronage of king' Mayura sarma of Kadamba dynasty, there were no Brahmanas in Kerala.

Inscriptions reveal that, the founder of the Kadamba dynasty of princes who ruled at Banavasi in North Kanara as the Capital, was Mayuravarma (the name is variously recorded, as Mayura varma and Maurya Sarma). He was the Founder of the Brahmana dynasty of princes known as "Kadamba,"

The traditions and written record's of the Nambudri Brahmanas of Kerala extend back to 'Mayuravarma.' The Brahmanas imported by Mayura Varma were at the time of their migration the disciples and followers of the famous Kumarila Bhatta or Bhattacharya. but after the migration they accepted the principles and became the adherents of the philosophy of Sri Sankara (birth 509 'E. C.) which prevailed in KeraIa.

In the fifth volume of the same publication Sri Subramanya Ayyer writes:-"':The Danta 'Kadha list in 'Kerala Mahatmya declares that the Nambudri Brahmanas of Kerala" were the descendents of immigrants from" Ahikshetra.

The sentences are a quotation from the ancient Sanskrit books 'Kerala Mahatmya' and 'Keralotpatti'. Andhra praehalana or 'Andhra movements', a small publication of the Andhra Mahasabha, immediately after the first conference of the Andhra Sabha, also claims that 'the famous historical personages of Mayura varma, Bhattacharya and Sri Sankara were all Andhras. Several of the Dantna stories also support the claim.

Even V. A. Smith[127] admits in p. 43 of his history of India that the kings of the Kadamba dynasty who ruled over the region comprising the Kanara and the northern districts of Mysore from the 3rd to the 6th centuries after Christ were Brahmanas. Thus the Kadamba princes who ruled over Kerala from the 6th century before Christ to the 6th century after Christ and the Brahmanas who migrated to the Country along with them and under their patronage were all Aandhras.

Among the Brahmanas who thus migrated from Ahikshetra or Sarpavaram, a village in the Godavari District) to Kerala under the patronage of Mayura-Sarma the Brahmana ruler of Kerala. there was a Brahmana scholar of the name Siva guru who settled down in the village Kaladi in Kerala. To him, after he had settled in Kerala was born 'Sri Sankara the first.' So Sri Sankara the Great Advaitic Philosopher and the Nambudri Brahmanas were all of Andhra descent, 'Sri Ramanuja' the Great protagonist of 'Visishtadwaita' bore the surname (family name) "Aasuuri". Surnames or house names constitute a distinguishing feature of the Aandhras, among the different peoples of south India.

Tamilians have no surnames or house names. So Sri Ramanuja should be deemed to belong to a family of Andhra Brahmanas, who had migrated to the Tamil country and settled down there some generations previous to him. Even so, 'Madhva-Acharya,' the great exponent of the 'Dvaita system' of philosophy bore the surname of Nadiminti. (Madya geh) He should be similarly deemed to belong to an Andhra Brahmana family that had migrated to the Kannada country and settled down there. Sri Tallapaka Annamacharya, and his son Sri Tiruvengalayya who lived in the 15th century, and Kshetrayya of the 7th century who composed the songs known after him and the

[127] Smith, Vincent A Oxford History of India

famous Thyagaraja of the 18th century, author of the immortal songs inculcating and expressing at the same time the principles of devotion (Bhakti) enlightenment (Jnana) and renunciation (Vairagya) all these celebrated musical composers were of Andhra descent though belonging to families that had migrated to and settled down in several parts of the other regions in South India. The great scholar Kumarila Bhatta of 557 BCE" who stemmed the advancing tide of the Jaina and Bouddha religions and safeguarded the ancient Vaidic religion of the country, was an Andhra. The great savant 'Vidyaranya who wrote authoritative commentaries on the four Vedas and preserved for us knowledge of the contents of the Vedas to this day was an Andhra.

Hence the sage 'Appayya Dikshitha:' declares "It should be deemed a great good fortune to be born an Andhra, to claim the Andhra language as ones mother tongue; to' 'live in Andhra Desha, further to the Vaidic cultural tradition and then to be a student of the Yajurveda'. It is a good fortune possible only for one with rare accumulated merit." It need not be mentioned that he himself was an Andhra (though he is said. by some. to belong to the Dravida branch: even if it is conceded; it only means he belongs to a group of Dravida or Tamilian families that migrated to Andhra in the remote past. settled down there in such remote past that they had long ago forgotten and given up the use of the Tamilian language even in their homes, and made the Andhra language their mother tongue. Even then we have every right to claim him to be an Aandhrai. There are several other great personages among Andhras in every period Ancient and modern.

Source: Chronology of Ancient Hindu History Part 1. author and publisher ¡§ Bharata Charitra Bhaskara¡¨, ¡§Vimarsakagresara¡¨ Pandit Kota Vankatachela paakayaaji Kali 5058, AD 1957- Arya vignana Grantha Mala , Publication No 23



(3393 words)

Appendix E

Select Bibliography

Aurobindo, The Secret of the Veda, Pondicherry, India, Ed.7, 5. 1993.
Davis, Mike, Late *Victorian Holocausts,* Verso 2002
Dayanand Saraswati, Satyartha Prakash
Elst, K., Indigenous Indians (Agastya to Ambedkar), New Delhi, 1993.
Frawley David, Gods, Sages and Kings, Utah, USA, 1991.
Hodivala S.K., Zarathustra and His Contemporaries in the Rg Veda, 1913.
Kak, S., "On the decipherment if the Indus Script - A preliminary
Study of its Connection with Brahmi," Indian J. of History and Science, V.22.1, p.51-62, 1987.
Kulkarni, S.D., Ed., Beginnings of Life History and Culture, The
Study of Indian History and Culture, Thane, India, 1993.
Kulkarni, S.D., Ed., Glorious Epoch, The Study of Indian History and Culture, Thane, India, 1993.
Kulkarni, S.D., Aadi Shankara, Bombay, India, 1987.
Maxmuller F., History of Ancient Sanskrit Literature, 1968.
Mittal, S.C., India Distorted, ISBN 8185880646, 1995, 3 Volumes
Narayana Shastri T.S., Age of Shankara, Madras, 1916.
Oak P.N., World Vedic Heritage, New Delhi, 1984.
Pargiter, F. E.,Ancient Indian Historical Tradition, OUP, London, 1922
Patnaik K.N.S, "The Mahabharata Chronology",
Annual Research J. of the Institute of Rewriting Indian History, Pune, India, 1990.
Pococke E., India in Greece
Rajagopalachari C., Indian Philosophy
Ramachandran, V.G., A Peep into the Past History, Madras, 1982.
Rao, S.R., Lothal and the Indus Valley Civilization, Bombay, India, 1973.
Sathe S., Dates of the Buddha, Hyderabad, India, 1987.
Sathe Sriram, Search for the Bharata War, 1983.
Sethna, K.D., The Problem of Aryan Origins, New Delhi, 1992.
Spencer H.S., Are the Gathas pre-Vedic?, 1965.
Talageri, S., The Aryan Invasion and Indian Nationalism, New Delhi, 1993.
Tilak B.G., The Arctic Home in the Vedas, Pune, India, 1987.
Tilak B.G., The Orion or Researches into the antiquity of the Vedas, Pune, 1994.
Vallency C., Collectania De Rebus Hibernicus, Dublin, 1804.
Vartak P.V., *Swayambhu*, Pune, Bharat, 1988.
Vartak P.V., *Vastav Ramayana* (in Marathi), Pune, Bharat, 1993.
Venkatachalam, K., The *Age of Buddha, Milinda and Amtiyoka and Yuga Purana,* Vijaywada, India, 1956.
Wheeler, M., *Civilization of the Indus Valley and Beyond*

Yukteshwar, Sri, *The Holy Science*, Los Angeles, 1984.
The Aryan Pages, The Vedic institute Of Aryan Studies
Sengupta, P. C., (1947*) Ancient Indian Chronology*, University of Calcutta, Calcutta
Sengupta, P. C., (1927) *Aryabhattiyu*m,

References on Indic History

The History and Culture of the Indian People (HCIP) by R.C. Majumdar is a
comprehensive multivolume series that covers the entire history pretty well too
but then he is also called "saffron" though what he
wrote is the same as written by the Muslim historians
A comprehensive History of India , K.A. Nilakanta Sastri et al (editors.) Calcutta, 1957 **A History of South India from Prehistoric Times to the fall of Vijayanagar,** K.A. Nilakanta Sastri, K.A. Nilakanta Sastri, Madras , 1955
Eminent Historians, their technology, their line and their fraud, Arun Shourie, ASA, New Delhi,1998.
A Brief Bibliography of Military History (University of Illinois)
Contains a decent collection of titles on Indian History from Ancient to Post Independence

The Vedic, Sutra & Saraswati Sindhu Periods

Royal Chronology of India (an excellent start to unraveling the detailed chronology of ancient India and rescue it from the hopeless inconsistencies that it has been driven to by the initial mistakes of Sir William Jones and the cavalier treatment meted out by Friedrich Maximillian Mueller
R L Bhargava India in the Vedic age
Talageri, Shrikant G. The RIG-VEDA.A Historical Analysis **,**
Aditya Prakashan, New Delhi,2000.**There is an on line copy**
Dowson, John ,1820-1881, A classical dictionary of Hindu mythology and religion, geography, history, and literature. -- London, Trübner, 1879.]
Danielou,Alain, "The Myths and Gods of India", Princeton Bollinger Series
Somadeva <11. Jhdt. n. Chr.>: Kathasaritsagara : der Ozean der Erzählungsströme : ausgewählte Erzählungen / übersetzt und erläutert von Alois Payer. -- 2. Buch I, Welle 1. -- 4. Vers 27 - 46: Rahmenerzählung I: Die Kurzgeschichte, Parvatis frühere Geburt. -- Fassung vom 2006-11-16. -- http://www.payer.de/somadeva/soma024.htm .
David Frawley (Vamadeva Shastri) RIG VEDA AND THE HISTORY OF INDIA (Rig Veda Bharata Itihaasa) Aditya Prakashan, 2001, New Delhi,
ISBN 81-7742-039-9. American Institute of Vedic Studies
PO Box 8357, Santa Fe NM 87504-8357
www.vedanet.com,
Vedic Aryans and the Origins of Civilization
Navratna S. Rajaram & David Frawley

(with a Foreword by Klaus K. Klostermaier)
New Delhi, Voice Of India, 2001, 3rd Edition
The deciphered Indus script
Rajaram, N . S., and N Jha, .Aditya Prakashan, Delhi , 2005, ISBN 8177420151
Chronology of Ancient India : From the Times of the Rigvedic King Divodasa to Chandragupta Maurya, with Glimpses into the Political History of the Period/Sita Nath Pradhan. Reprint.. 1996, 291 p.
Contents: 1. Divodasa and Dasaratha. 2. Kings of other dynasties contemporary of Divodasa. 3. The descendants of the king Satvant of the Yadus. 4. The lineal descendants of Bhargava Vitahavya. 5. The Magadha dynasty. 6. The Hastinapur line. 7. The Northern Pancalas. 8. The Southern Pancala line. 9. The Anga dynasty. 10. The descendants of Dasaratha Aiksvaka. 11. The Janaka dynasty. 12. The Southern Kosala line. 13. The Kasi dynasty. 14. A series of Vedic teachers. 15. Distinguished Rsis belonging to the period. 16. Chronology. 17. Chronology developed in 'Rigvedic India' untenable. 18. Chronology developed in 'the Orion' untenable. 19. Aryan settlement of India during the Rgvedic period. 20. From Bimbisara to Chandragupta Maurya. 21. The Pradyota dynasty. 22. Important dates. 23. The date of the Mahabharata war. Index.
This book provides an interesting foray into the undated history of ancient Vedic, Brahamanic and Puranic India. Based upon the author's research into ancient Indian literature like the Puranas, Mahabharata, Ramayana, Aranyakas, Upanisads etc, along with Buddhist, Pali and Jain evidences; this work provides the only attempt at historically authenticating what has generally been relegated to the folk or mythical level. This includes providing the correct genealogies of the ancient Indian dynasties and putting events in a proper chronological order and to provide sequential dating to important events, such as the Mahabharata war. This work of remarkable scholarship has provided a critique of all existing works on the era and made reference to every known historical explanation." (jacket)
The Aryan Problem, **A linguistic Approach**, by Satya Swaroop Misra,Munshiram Manoharlal Publishers PLtd.,1992
Bryant, Edwin and Laurie Patton The Indo Aryan Controversy - Evidence and Inference in Indian **History, ,Routledge, London,2005**
Sethna, K D.,The Problem of Aryan Origins, from an Indian Point of View, Aditya Prakashan, 1980
Sethna, K D. Problems of Ancient India**/** Delhi, Aditya, 2000, 306 p., ISBN 81-7742-026-7.
Dilip K Chakrabarti , Colonial Indology, SocioPolitics of the Ancient Indian Past , , Munshiram Manoharlal PublishersP Ltd.,1997,
B. P. Radhakrishna and S. S. Merh ,VEDIC SARASWATI ,Evolutionary History of a Lost River in North Western India (Memoir 42) ,Geological Society of India, P.B. No. 1922, Govipuram, Bangalore-560019
Pratapaditya Pal, Art from the Indian Subcontinent, Yale University Press, In association with the Norton Simon Art Foundation
David Frawley, The Rig Veda and the History of India, AdityaPrakashan, Delhi, 2003

Krishna Dvaipayana Vyasa The Srimad Bhagavatam, Eng. Translation by J M Sanyal,Oriental Publishing Co. Calcsutta, 1932

VedaVyas Astronomical Dating of the Mahabharata war,ISBN 817460019,Hyderrabad, 1993

Classical Period

Alberuni's India An account of the Religion ,Philosophy, Literature, Geography, Chronology, Astronomy, Customs, Laws, and Astrology of India about 1030 CE translated by Dr. Edward Sachau, published by Rupa and Co., NewDelhi 2002

Nilakanta Sastri, K A , Editor A comprehensive History of india, Vol II, The Mauryas and the Satavahanaas, ISBN 8170070597, Peoples Publishing House,New Delhi ,, 1987

Sir Vepa Ramesam Andhra Chronology, K Mahadevan, Madras, 1940

Medieval (Muslim) Period

Mahomed Kasim Ferishta, translated by John Briggs . History of the Rise and fall of the Mohamedan Power in India

Travels of Ibn Batuta -- translated by H A R Gibb gives first hand account of the Sultanate rulers of India as observed by a Muslim traveller -- he can hardly be called "saffron".

Elliot and Dawson , History of India as told by its own historians

Jadunath Sarkar is a well respected historian and his books on Aurangzeb and other Muslim rulers are also a good source. His book on Aurangzeb is not easily available since reprint rights are not granted. Some libraries might have old prints. It is worth reading though. Sarkar does have his bias against the Marathas, for whatever reason.

Abul Fazl, Akbarnama

Jehangir Intikhab I Jahangiri

Lal, K.S., Legacy of Muslim Rule in Indi**a ,**New Delhi, Aditya Prakashan, 1992 406 pgs, ISBN 81 85179 03 04.

Other books by K.S. Lal

History of the Khaljis (1950, 1967, 1980)

Twilight of the Sultanate (1963, 1980)

Studies in Asian History (edited - 1969)

Growth of Muslim Population in Medieval India (1973);

Early Muslims in India (1984); T

he Mughal Harem (1988);

Indian Muslims: Who Are They? (1990);

Muslim Slave System in Medieval India (1994);

Growth of Scheduled Tribes and Castes in Medieval India, Aditya Prakashan (1995)

Theory and practice of the Muslim state in India,(1999) }
The following is not a book on Indian History but describes the concept of Jihad
Jihad in the West : Muslim Conquests from the 7th to the 21st Centuries by Paul Fregosi, Hardcover - 442 pages (October 1998) Prometheus Books; ISBN: 1573922471 . **Sita Ram Goel** , Hindu Temples what happened to them , Vol.2, the Islamic Evidence, Voice of india, ISBN 8185990034 , Delhi, 1993

Some British writers of Indian History from whom we have learnt Indian History

James Mills , History of India
Major General John Malcolm - A Memoir of the Central India (1824)
Captain Grant Duff - History of the Marathas (1826)
Gen. John Briggs - History of the Rise of Mohammedan Power in India (1829)(translation of Tarikh i Farishta by Farishta)
Lt.Colonel James Todd - Annals and Antiquities of Rajasthan (1829-32)
Montstuart Elphinstone (Resident at Peshwa Court, later Governor of Bombay), History of India (1841)
Joseph Davey Cunningham (brother of Gen.A.Cunningham) History of Sikhs (1849)
Lt. R.F.Burton - History of Sindh (1851)
Hunter, William Wilson, The indian Empire , Asian Educational Services, Originally published 1886
Thomas Babington Macaulay Critical and Histporical Essays
William Wilson Hunter, The Indian Empire,Trubner, London,1885, Reprinted by Asian Educational Services, ISBN 8120615816 Sir H M Elliot & John Dowson The History of India as told by its own Historians,The Mohammadan Period, First Published 1867, Reprinted 1990, 8 volumes, ISBN 8175360518
F**rancis Younghusband** Kashmir

British colonial period

Peter Hopkirk "The Great Game , The struggle for empire in Central Asia",Kodansha International, first published 1990
Sir Penderel Moon The British Conquest and Dominion of India" . Published in two volumes by India Research Press, 1999. Pages 1264. Price Rs 1800.
Independence Movement and Post Independence Period
RC Majumdar, 'History of the freedom movement in India',1962, 2nd revised edition, Firma KL Mukhopadhyay, Calcutta, 1971
Sir C Y Chintamani, Indian Politics since the Mutiny ,Rupa and Co.,Delhi,, 2002 **C Y Chintamani,** the Liberal Editor politician by Sunil Raman, Rupa and Co.,2002, describes the life of a genuine liberal , during an era when the word was used for those who were under suspicion of harboring seditious ideas against British Rule.
M Visvesvaraya, Engineer and Nation Builder **,**by Dilip Salvi**,** Rupa and Co., Delhi ,2003, ISBN 8129102269 . Describes the life of one of India preeminent engineers during the British era
V. L .N .Row Witness to a Saga [128] **,** a memoir of my father describes many anecdotes during the British era from the point of view of a middleclass Indian.
V.P. Menon, The Transfer of Power in India, Bombay , 1957

---

[128] http://vepa.us/dir5/Book/index.htm

V.P.Menon, The story of the Integration of the Indian states, Bombay, 1956.
Claude Arpi, The Fate of Tibet, When big insects eat small insects,with a Foreword by His Holiness the Dalai Lama,New Delhi, Har-Anand, 1999
Eminent Orientalists , an Anthology, First Published ,Madras 1922 , ISBN 81 20606973 , AES reprint 1991
S. Gurbachan Singh Talib,Muslim League Attack on Sikhs and Hindus in the Punjab 1947
Compiled for the SGPC , Introduction to the reprint by Ram Swarup,Voice of India, New Delhi **Kosla Vepa,** The South Asia file[129]
Mittal, S.C., India Distorted, ISBN 8185880646, 1995, 3 Volumes
Nicholas Dirks, Castes of Mind, Colonialism and the making of Modern India, Princeton U press, Princeton, 2001, ISBN 0891088950
Nicholas Dirks The Scandal of Empire, Belknap Harvard, Harvar, 2006, ISBN 0674021665 **Bernard Cohn** Colonialism and its form of knowledge, Oxford U Press, Delhi,1997, ISBN 019564167

The following are available as digitized editions

http://www.indicethos.org/History/Digitallibrary.html

Early history of Kausambi, from the sixth century B.C. to the eleventh century A.D. , by Nagendra Nath Ghosh.

Ancient India as described by Megasthenes and Arrian by J McCrindle

Arrians History of Alexander by Henry Rooke (this version of the book has been altered and corrected by J Davis in 1812 and so this is not the orginal verson of the book that was first published in 1729

The History of India by Montstuart Elphinstone

India in Greece: Or, Truth in Mythology: Containing the Source (Pocock)

Ancient and Medieval India by Manning

Elementary Algebra with brief notices of History contains a good discussion of Indic mathematics

Supplementary Catalog of Sanskrit, Pali and Prakrit Books

Primary and other Sources in the Indic Sciences of antiquity

[129] http://indicethos.org/The%20South%20Asia%20File.html

Primary Sources

Aitreya Brahmana (AB) ***Aiitreya***
Aranyaka (AA) Keith, Barriedale, Master Publisers, Delhi
Amarakosha (AM)with Maheshwari Commentary, Nirnaya Sagar Prakasahana, Mumbai, 1969
***Arthasastra* by Kautilya (ASK)**
Aryabhata Siddhanta of Aryabhata Ia (ASA)
Aryabhattiya of Aryabhata Ib (A)

Aryabhatiyam with Vyakhya of Paramesvara, Leyden, 1885, Kern, B. (ed.),
***Aryabhatiya – vyakhya by* Suryadeva Yajwan**
***Aryabhatlya* of Aryabhata I - (**1) Critical Edition and trans. with notes by K.S. Shukla and K.V. Sarma,
(2) With Nilakantha Somasutvan's commentary., edited and published (in 3 parts) by K.Sambasiva Sastri, Trivandrum, 1977 (Reprint).
Baudhayana Dharmasutra (BD*) Chowkamba Sanskrit Seris, Varanasi, 1972*
***Bhaskarivabhasya* by Govindasvàmin** (c. 830 CE) Billard (1971), p.81
Commentary on the *Aryabhatiya* by Bhâskara (629 CE) [K. S. Shukia and K. V. Sarma (1976)1
***Bjaganitam* of Bhaskara II -** Edited by Sudhakara Dvivedi, BenaraS Sanskrit Senes, 1927; with commentary. *Navhkura* by Krshna Daivajna, Anandashrama Sanskrit Series, Poona, 1920.
A Bibliography of Kerala & Kerala-based Astronomy & Astrology, Sarma, K.V., Hoshiarpur, 1966

***Brahmasphuta Siddhanta* of Brahmagupta, 628 CE,** — Edited with Vaasana Commentary. By(1) Ram Swarup Sharma, 4 vols., Indian Institute of Astronomical and Sanskrit Research, New Delhi, 1966. (2)Sudhakar Dvivedi 1902
Brihat Parasara Horasastra Chowkamba Sanskrit series, Varanasi, 1973
Brhat-Samhitä of Varahamihira- Eng. Translated and Notes by M. Rama krishna Bhat, Motilal Banarsidas, Delhi, 1981.
Chandrachayaganitam, Computation concerning the shadow of a moon, , VVRI, Hoshiarpur, , Kerala University Book Number KR B9x I431526
***DrgganItam* of *Paramesvara-Critical* Edition 1431** CE by K.V. Sarma, Vishveshvaranand Vedic Research Institute (V.V.R.I), Hoshiarpur, 1963.
***Ganaka-tarañgini* of Sudhakara Dvivedi-**Edited by Sadananda Shukia, Varanasi, 1986.
Ganita-Sãra-Sangraha of Mahaviraacharya – 850 CE, (1) Edited with Eng. Translation by M. Rangacharya, Madras, 1912. (2) Hindi Translation by L.C. Jam, Sholapur, 1963.
Ganita-Yuktayah (Rationales of Hindu Astronomy) –Critical Edition with lntro. and App. by K.V. Sarma, Hoshiarpur, *1979.*
GoIadipik of Paramesvara- Edited With lntn., Tr and Notes by K.V. Sarma, Madras, 1956-57.
Grahacharanibandhana by Haridatta (c. 850 CE) [Sarma (1954)], available in Kerala University Library.. Basic text where he describes the Katapayadi system
Graha-Laghava of Ganesha *Daivajna-(1) with commentary. of Visvanatha Daivajna and Maadhuri Sanskrit-Hindi commentary. by Yugesvara* Sastri, *Benares, 1946. Also Motilal BanrsiDas*
(2) With commentary. of Mallari and Visvanatha and Hindi commentary by
Kedarnath Joshi, Motilal Banarsidas, Varanasi, 1981.
***Grahanastaka* of Paramesvara** - Edited and Translated by K.V. Sarma, JOl,
Madras, 28, Parts (i)-(iv), 47-60, 1961.
***Grahana-nyäya-dipika* of Paramesvara** - Critical Edition with Translation by K.V. Sarma, VVI., Hoshiarpur, 1966.
***Grahana-Mananam* of Paramesvara** - Critical EDITED with Tr by K.V. Sarma, V.V.R.l., 1965.
Indian Astronomy: A source book (eds. Subbarayappa,B.V. & Sarma, K.V.), Bombay, 1985
Critical Study of Ancient Hindu Astronomy, Somayajii,D.A., Karnatak University, Dharwar, 1972

A History of Indian Astronomy (eds. Shukla,K.S. & Sen,S.N.) INSA, New Delhi, 1985 5)
Aryabhatiya with the Commentary of Bhaskara I and Someswara (eds.Shukla,K.S. & Sen,S.N.) INSA, New Delhi, 1976
Siddhantasiromani, Varanasi, 1981 , Muralidhara Chaturveda (ed.),
Aryabhatiyam with the Bhashya of Nilakantha Somasutvan: Golapada (ed. Pillai, S.K.), Trivandrum Sanskrit Series, no 185, 1957
Tantrasangraha of Nilakantha Somasutvan with the commentary Laghuvivritti of Sankara Variar (ed. Pillai, S.K.), Trivandrum Sanskrit Series, no 188, 1958
Mahabaskariam with Govindasvamin's Vyakhaya and Siddhantadipika of Paramesvara, Madras Govt. Oriental Series, no 130, 1957 Kuppanna Sastri,T.S. (ed.),
Grahasphutanayane Vikshepavasana of Nilkantha Somastuvan in Ganitayuktayah, Hoshiarpur, 1979 , Sarma, K.V. (ed.),
Aryabhatiyam with the Bhashya of Nilakantha Somasutvan: Kalakriyapada, Trivandrum Sanskrit Series, No 110, 1931 , Sambasiva Sastri,K.
Siddhantadarpana, Hoshiarpur, 1976 Sarma,K.V. (editor & translator)
Mahabhaskariya of Bhaskaracharya,I, edited & translated by Shukla,K.S., Lucknow, 1960.
Sphutanirayanatantra of Acyuta Pisarati, Hoshiarpur, 1974 ,Sarma,K.V. (ed.)
Rasigolasphutaniti of Acyuta Pirasati, ed & translated by Sarma,K.V., Hoshiarpur, 1977.
Siddantadarpana of Mahamahopadhyaya Samanta Sri Chandrasekhara Simha, Calcutta 1897, V.36) 18) Nature, 1532, 59, 437, 1899 (by W.E.P.)
***Jyotirmimämsa* of Nilakantha Somayãji -** Edited with Critical lntro. and App. by K V. Sarma, V.V.B.I.S. & l.S., Hoshiarpur, 1977..
***Karana-kutühala* of *Bhaskara II* -** (1) with *Ganaka-kumUdakaUmudi* commentary. of Sumatiharsa and Väsanä Vibhusana Commentary. of Sudhakara Dvivedi and Hindi translated by **Dr. Satyendra Mishra, Varanaasi, 1930(2)** with *Ganaka-Kumuda-Kaumudi* Commentary. of Sumati Harsa, Bombay 1989
Karanapaddhati by K. S. Sastri Pudhumana Somayâjin (eighteenth century CE) (1937)]
Khanda-Khaadyaka of Brahmagupta - (1) Edited with commentary. of Chaturveda **PrthUdakasvami by P.C Sengupta,** Calcutta, 1941; Translated by P.C. Sengupta, Calcutta, 1934.
(2) With comm. of Battotpala Edited and Translated by Bina Chatteijee in 2 parts. New Delhi. 1970.
Laghubhakariyam of Bhskara I - Edited and Translated by K.S. Shukla,
Lucknow, 1963. **Laghubháskariyaivivarana by Shankaranâràyana** (869 CE) [Billard (1971), p.8]

***Laghumänasam* of Manjula -** Critical Study, Tr. and Notes by Kripa
Shankar Shukla, I.J.H.S., Vol 25, Nos. 1-4, New Delhi, 1990.

The Lilavati is only one of four parts of the Siddhanta siromani , Lilawati, Beejaganit, Ganitadhyaya and Goladhyaya,

***Lilavati* of Bhaskara II -** (1) Edited with H.T. Colebrooke's Tr. and
Notes by Haran Chandra Banerjee, Calcutta, 1927.
(2) With Hindi Tr. by Ramaswaroop Sharma, Bombay. 1897-98.
(3) With *Kriyikamakari* commentary. of Sankara Vãriyar and Nãiyana, Critical Ed_ with Introduction and App. by K.V. Sarma, V.V.R.1.. 1975.
(4) **Lilavati of Bhaskaracharya** - A Treatise of Mathematics of Vedic Tradition, K.S. Patwardhan et al, Motilal Banarasidas Publishers
Lilavati of Bhaskaracarya : A Treatise of Mathematics of Vedic Tradition : with rationale in terms of modern mathematics largely based on N.H. PhadkeÆs Marathi translation of Lilavati
Author : translated by Krishnaji Shankara Patwardhan, Somashekhara Amrita Naimpally and Shyam Lal Singh
L*okavibhaga* . Jaina text dated 25th August, 453 CE, Sholapur, P. Balachandra Siddhanta Shastri.

***Mahabhãskaryam* of Bhäskara I -** (1) Critical Edition with Bhasya of Govindasvämin and Super-Commentary.
***MahaBhashya* by Patanjali**
The *Pancha Vimshati Brahmana the Knowledge Book of the twenty five chapters*
Pancha Siddhantika of Varähamihira - (1) Edited with Sanskrit Commentary. - and Eng. Translated by G. Thibaut and S. Dvivedi, Reprint, Motilal Banarsidas, 1930 *(2) Text, Translation and Notes (2 Parts) by* 0. *Neugebauer and D. Pingree, Kopenhagen, 1971;* (3) With Translated and Notes of Prof. T.S. Kuppanna Sastri, Critical Edited by K.V. Sarma. P.P.S.T. Foundation Madras. 1993
Rajatarangini by Kalhana, translated by Aurel Stein
Rajamriganka* by Bhoja** (1042 CE) [Billard (1971), p.101. ***Satapatha Brahmana
***ShishyadhIivrddhidatantra* by Lalla** (tenth century CE) [Billard (1971), p. 10
***Siddhanta-darpanam* of Nilakantha Somayãji**-with Auto—commentary. (1500 CE) Critical Edited with lnterpretation, Translated and App. by K.V. Sarma, V.V.B.LS. & LS., Hoshiarpur, 1976.
***Siddhäntadipikä* of Paramesvara** byT.S. Kuppanna Sastri, Madras, 1957;
2) Edited with Translated. Notes and Comments by Kripa Shankar Shukla, Lucknow. 1960
***Siddhántashekhara* by Shripati** (1039 CE) [Billard (1971), p. 101
Siddhãnta-siromani* of Bhaskaracharya ll-.(**1) Edited with Bhaskara's commentary. *Vaasana* by Sudhakara Dvivedi, Kashi Sanskrit Series, No. 72, Benaras, ***Siddhantasiromani by Bháskaráchârya (1150 CE) [B. D. Sastri (1929)1
1929.(2) With ***PrabhaVaasana* commentary**. by Murlidhara Thakur. Kashi Sanskrit Series, No. 149, Banaras, 1950 (3) Edited by Bãpudeva Sastri and revised by Ganapati Deva Sastri. 2nd Edition. 1989.(4) Eng. exposition by D. Arkasomayãji. Kendriya Sanskrit Vyapeetha, Tirupati, *1980*
Siddhântatattvaviveka by Kamâlakara (seventeenth century CE) (1935) Sudhakar Dwivedi--
Sh*isya-dhi-vrrIdhi- da* of Lalla-with commentary. of Mallikarjuna Suri, Critical Edited with lntn., Translated, Math. Notes and Indices in 2 parts by Bina Chartterjee, l.N.S.A., New Delhi, 1981.
***Sphuta-Chandraptikn* of Mädhava of San*gramgama* -** Critical Edited with mm., Translated and Notes by K.V. Sarma, V.V.R.I., Hoshiarpur, 1973.
***Sulba-Sutras (Baudhäyana, Apastaimtia, Katyyana and Wanava)* 1989.**
Text, Translated and Commentary. by S.N. Sen and A.K. Bag, I.N.S.A.,
***Surya-Siddhanta* - (SS-1) Translated by Rev.E.Burgess, Edited and reprinted** by Phanindralal Gangooli with lntn. by P.C. Sengupta, Motilal Banarsidass, Delhi, 1989.
(SS-2)Edited with commentary. of Paianiesvara by Kripa Shankara Shukia. Lucknow. *1957.*
(SS-3) With *Vasana Bhsva* in Hindi by Mahaviiprasad Siivastava
2ndEdited Dr. Ratnakurnari Svädhyya Sarnsthãna, Allahabad. 1983.
***Tantra-Sangraha of* Nilakantha Somayãji-**With, Yuktidipik and *Laghuvivriti* Commentary. of Sankara, Critical Ed with lntroduction and Appendix. by K.V. Sarma, V.V.B.l.S. & LS., Hoshiarpur, 1977.
***Surya-Siddhanta* - (SS-4)** Translated by Sudhikant Bhardwaj, Parimal Publications , 1991
Tithi-*Chintaamani* of Ganesha Daivajna - With commentary. of Visvanätha. Edited by D.V. Apte, Poona; 1942.

***Trishatiká* by Shridharachârya** , B. Datta and A. N. Singh (date unknown) [1938) p. 591

VidAyapañchddhydvi (Anon., fourteenth century CE) [Sarma and Sastri (1962)]

***Vedaañga-jyotisha* of Lagadha** Edited with Translated by R.Shamasastri,Mysore, 1936.

(2)With Translation and Notes of Prof. T.S. Kuppanna Sastry, Critically Edited by K V. Sarma, I.N.S.A., New Delhi,

1985. **3)*Jyotiṣavedāṅga*. English & Sanskrit.**

Vedanga jyotisham : sermons of the Sage Lagadha : Akhilanand Bhashyopetam = Vedāṅga jyotiṣam / English

translation and commentary by Suresh Chandra Mishra. -- 1st ed. -- New Delhi,India : Ranjan Publications, 2005.

220 p. ; 23 cm. In Sanskrit (Devanagari and roman transliteration);translation, commentary and pref. in English.

Authorship ascribed to Lagadha. 400 BCE On Vedic astronomy "The most ancient compendium of Vedic astronomy. A full fledged treatise : an adjunct to the Vedas"--Cover. ISBN 8188230502.

***Vakyapadiya* of** Bhartrihari

General References on Ancient Indian Astronomy and Mathematics

Al-Biruni, India, Edited with Translation ., Notes and Indices by Dr. Edward C. Sachau, Vol. l&ll, Reprinted, Low Price Publications, Delhi,
Abdi, Wazir Hasan, Enrichment of Mathematical Sciences in India - through Arabic and Persian, Sc. Herit. of Ind., The Mythic
Soc. Bangalore, 1988.
Abhyankar, K.D, Uttaräyana, Sc. Herit. of India., The Mythic Soc., Bangalore, 1988.
Abhyankar, K.D, A Search for the Earliest Vedic Calendar, Issues in Vedic Astronomy and Astrology, Rashtriya Veda Vidya Pratisthan, New Delhi, 1992.
Abhyankar, K.D, and Sidharth, B.G. Treasures of Ancient Indian Astronomy, Ananta Books Intl. Delhi, 1993.
Abhyankar, K.D. and Ballabh, G.M. Kaliyuga, Saptarisi, Yudhisthira and Laukika Eras, IJHS, 31(1), New Delhi, 1996.
AGRAWAL, D. P., THE KERALA SCHOOL, EUROPEAN MATHEMATICS AND NAVIGATION,
HTTP://WWW.INFINITYFOUNDATION.COM/MANDALA/T_ES/T_ES_AGRAW_KERALA.HTM
Aiyar, B.V. Kamesvara. 1922. "The Age of the Brahmanas". Quarterly Journal of the Mythic Society 12.
Alladin, Saleh Mohmmed, interaction of Arab and Persian Astronomers with India, Sc., Herit. of Ind., The Mythic Soc, Bangalore, 1988.
D.F. Almeida, J. K. John, and A. Zadorozhnyy, Keralese Mathematics: Its Possible Transmission to Europe and the Consequential Educational Implications. Journal of Natural Geometry 20, 77-104, 2001.
Ansari, S.M.R., introduction of Modem Western Astronomyin India during the 18-19 Centuries, Hist. of Astronomy. in India, INSA, New Delhi, 1985. Aryabhata Colloquium
Proceedings of the Internationalll Seminar annnd Colloquium on the 1500th Anniversary of the Aryabahateeyum,2002, Kerala Sastra Sahitya Parishad, AKG RD. Kochi 682024, Kerala, India, sasthra@md3.vsnl.net.in
Bag, AK., Mathematics in Ancient and Medieval India, Chaukhambha Orientalia, Delhi, 1979.
Bag, A.K. Astronomy in Indus Civilization and during Vedic 7imes, IJHS, 20(14), 1985.
Bag, AK. Ritual Geometiy in India and its Parallelism in other Cultural Areas, IJHS, 25(1-4), New Delhi, 1990 .
Balakrishnan , N.,(2005)Quotations – Ancient Indian Science – Mathematics and Astronomy
Ancient Indian Literature on Mathematics and Astronomy,Depth of Knowledge in Ancient Indian Astronomy
Balachandra Rao., S., Tradition, Science and Society, Navakar i nataka Publications, Bangalore, 1990.
Balachandra Rao. S., Mahãvirachäryas Contribution to Mathematics, Scientific Heritage of India, The Mythic Society, Bangalore, 1988.
Balachandra Rao, S., Insdian mathematics nd Astronomy, Bhavans Gandhi Centre for Values, Bharatiya Vidy a Bhavan, Bangalore., hid edition, 2004
Balachandra Rao, S. , Indian Mathematics and Astronomy. Jnana Deep Publications, Bangalore, 1994.
Bandopadhyay. Amalendu, Our National Calendar, Science Reporter, 19(1), New Delhi, 1982.
Bhanu Murthy, T.S., A Modem Introduction to Ancient Indian
Mathematics, Wiley Eastern Ltd., 1992.

Bhat, M R Varahamihira's Brhat Samhita. Motilal Banarsidass, Delhi, 1981.
Bhate Saroja and Subhash Kak, "Panini's grammar and computer science." Annals of the Bhandarkar Oriental Research Institute, vol. 72, 1993, pp. 79-94.
Bhate, Saroja Panini, Sahitya Akademi
Bhattacharaya, J.C. and Vagiswari, A., Astronomy in India in the 20th Century, Hist. of Astronomy in India, INSA, New Delhi, 1985.
Billard, R L L'Astronomie Indienne. Ecole Francaise d'Extreme Orient, Paris, 1971.
Bose D.M., Sen, S.N. and Subbarayappa, B.V., A Concise History of Science in India, Reprinted, l.N.S.A., New Delhi, 1989.
C B Boyer "The History of Calculus an dits conceptual development", New York, 1949, p61,62.
D.M. Bose, S. N. Sen, and B. V. Subbarayappa (Eds.). A concise history of science in India. Indian National Science Academy, New Delhi, 1971.
Brennand, W "Hindu astronomy" xv, 328 pages, with 13 illustrations ,1988,Caxton Publications, B-3//53, Ashok Vihar, Phase II, Delhi 1100052 (India, 27112866
Bressoud, David (2002), "Was Calculus Invented in India?", The College Mathematics Journal (Math. Assoc. Amer.) 33(1): 2-13.

Bryant, Edwin (2001), The Quest for the Origins of Vedic Culture, Oxford University Press \ Saroja Bhate and Subhash Kak, "Panini's grammar and computer science." Annals of the Bhandarkar Oriental Research Institute, vol. 72, 1993, pp. 79-94.
Burgess, Ebenezer The Surya Siddhanta. Motilal Banarsidass, Delhi, 1989 (1860).
Dharampal, Indian Science and Technology in the Eighteenth Century. Impex India, Delhi, 1971.
Cajori, F; History of Mathematics. New York, 1958.
Calendar Reform Committee, Report, CSIR., New Delhi, 1955.
Chakravarty, A.K., Three 19th century Calcutta astronomers,
IJHS, 30(2-4), New Delhi, 1995.
Chakravarty, A.K., Evolution of Dating System, IJHS, 31(1), New Delhi, 1996.
Colebrooke, H.T., Algebra with Arithmetic and Mensuration from the Sanscrit of Brahmagupta and Bhaskara, London, 1817. Colebrook also presents some of the upa-pattis given by the commentators Ganesha Daivajnya and Krishna Daivajnya, as footnotes in his work
S. Dasgupta, A History of Indian Philosophy. Cambridge University Press, Cambridge, 1932.
Datta, B. B., On Mahavira's Solution of Rational Rectangles, Bulletin of Calcutta Mathematical Society, 20, pp. 267-94,
1928-29.
Datta. Bibhutibhusan The science of the Sulba: a study in early Hindu geometry. Univ Calcutta, Calcutta, 1932.
Datta, B. B. and Singh, A.N., History of Hindu Mathematics, (2 parts), Reprinted, Asia Publishing House, Bombay, 1962.
Datta, B.B. and Singh, A.N. Hindu Geometry, Revised by K.S. Shukla, IJHS, 15(2), New Delhi, 1980.
Datta, B.B. and Singh, A.N., Hindu Trigonometry, Revised by K.S. Shukla, IJHS, 18(1), New Delhi, 1983.
Datta, B.B. and Singh, A.N., Use of Calculus in Hindu Mathematics, Revised by K.S. Shukla, IJHS, 19(2), New Delhi,1 984.
Dikshit, S.B., Bharatiya Jyotish Sastra, Parts I & II, Translated by R.V. Vaidya, Govt. of India, 1969 and 1981.
Koenraad Elst: Update on the Aryan Invasion Debate. 1999.
Duke, Dennis. 2005. "The Equant in India: The Mathematical Basis of Ancient Indian Planetary Models." Archive for History of Exact Sciences 59: 563–576.
McEvilley T M, The Shape of Ancient Thought: Comparative Studies in Greek and Indian Philosophies. Allworth Press, New York, 2002.
Feuerstein,G S. Kak, D. Frawley, In Search of the Cradle of Civilization: New Light on Ancient India. Quest Books, Wheaton, 2001.

Filliozat, Jean. 1969. "Notes on Ancient Iranian and Indian Astronomy." Journal of the K.R. Cama Oriental Research Institute 42:100-135.
Frawley. David1991. Gods, Sages, and Kings, Lotus Press, Twin Lakes, Wisconsin ISBN 0-910261-37-7

Fleet J.F., Aryabhata's System of Expressing Numbers, J. of Royal Asiatic Soc., pp. 109-16, 1911.
Gupta, R.C., The Hindu Method of Solving Quadratic Equation, J.of Birla Inst. of Tech., pp. 26-28, 1966-67.
Gupta, R.C., Bhaskara I's Approximation to Sine, Ind. J. of Hist. of Sc., 2, no.2, pp. 121-36, 1967.
Gupta, R.C., Second Order Interpolation in Indian Mathematics upto the Fifteenth CenturyA.D., IJHS,vol. 4, nos. 1 & 2, pp. 86-98, 1969.
Gupta, R. C. (1990). The Chronic Problem of Ancient Indian Chronology. Ganita-Bharati 12, 17-26. [Denoted by RG1]
Gupta, R. C. (1986). Highlights of Mathematical Developments in India. The Mathematics Education 20, 131-138. [Denoted by RG2]
Gupta, R. C. (1976). Aryabhata, Ancient India's Greatest Astronomer and Mathematician. The Mathematics Education 10, B69-B73. [Denoted by RG3]
Gupta, R. C. (1982). Indian Mathematics Abroad up to the tenth Century A.D. Ganita-Bharati 4, 10-16. [Denoted by RG4]
Gupta, R. C. (1974). An Indian Approximation of Third Order Taylor Series Approximation of the Sine. Historica Mathematica 1, 287-289. [Denoted by RG5]
Gupta, R. C. (1983). Spread and Triumph of Indian Numerals. Indian Journal of History of Science 18, 23-38
Gupta, R. C. (1987). South Indian Achievements in Medieval Mathematics. Ganita-Bharati 9, 15-40.
Gupta, R. C. (1976). Development of Algebra. The Mathematics Education 10, B53-B61.
Gupta, R. C. (1980). Indian Mathematics and Astronomy in the Eleventh Century Spain. Ganita-Bharati 2, 53-57.
Encyclopedia Brittannica 14th edition
Gupta, R. C. (1977). On Some Mathematical Rules from the Aryabhatiya. Indian Journal of History of Science 12, 200-206.

Heath, T.L., A History of Greek Mathematics, 2 vols., Oxford, 1921.
Jacobi, Hermann. 1909. "On the Antiquity of Vedic Culture." Journal of the Royal Asiatic Society 721-726.
.

Jain, L.C. and Kumari Prabha Jain, Certain special features of the ancient Jaina calendar, IJHS, 30(2-4), New Delhi, 1995.
Joseph, George Gheverghese, The Crest of the Peacock, Affiliated East-West Press, Madras, 2nd ed.,Princeton, 2000
Kak, Subhash, C., An Efficient Implementation of the Aryabhata Algorithm, Proc. 20th Annual Conf. on Information Sciences and Systems, Princeton, 1986
Kak, Subhash, Computational Aspects of the Aryabhata Algorithm, IJHS, 21(1), New Delhi, 1986.
Kak, Subhash, C., The Sign for Zero, The Mankind Quarterly, 30, 3, Spring, 1990.
Kak, Subhash, The Astronomical Code of the RigVeda Aditya Prakashan, New Delhi, 1994.
Kak, S C The Astronomical Code of the Rgveda. Munshiram Manoharlal, New Delhi, 2000.
Kak, Subhash, "Indian physics: outline of early history." ArXiv: physics/0310001.
Kak, S. C. (1993). Astronomy of the Vedic Altars. Vistas in Astronomy 36, 117-140.
Kak, S. C. (1988). A Frequency Analysis of the Indus Script. Cryptologia 12, 129-143.
Kak, S. C. (1999). The Solar Numbers In Angkor Wat. Indian Journal of history of Science 34, 117-126.
Kak, S. C. (1987). The Paninian Approach to Natural Language Processing. International Journal of Approximate Reasoning 1, 117-130.
Kak, S. C. (2000). Indian Binary Numbers and the Katapayadi Notation. Annals (B.O.R. Institute) 131, 269-272.
Kak, S. C. (2000). An Interesting Combinatoric Sutra. Indian Journal of History of Science 35, 123-127.

Kak, S. C. (1997). Three Old Indian Values of PI . Indian Journal of History of Science 32, 307-314.
Kak S. C, The Gods Within. Munshiram Manoharlal, New Delhi, 2002.
Kak S C, The Wishing Tree. Munshiram Manoharlal, New Delhi, 2001.
Kak S C, The Asvamedha: The Rite and Its Logic. Motilal Banarsidass, Delhi, 2002.
Kak S C, The Architecture of Knowledge. CSC, Delhi, 2004.
S. Kak, "Early theories on the distance to the sun." Indian Journal of History of Science, vol. 33, 1998, pp. 93-100. ArXiv: physics/9804021.
Kak, S C "Birth and early development of Indian astronomy." In Astronomy Across Cultures: The History of Non-Western Astronomy,Helaine Selin (editor), Kluwer Academic, Boston, 2000, pp. 303-340. ArXiv: physics/0101063.
Kak, S C "Concepts of space, time, and consciousness in ancient India." ArXiv: physics/9903010.
Kak, SC "Physical concepts in Samkhya and Vaisesika." In Life, Thought and Culture in India (from c 600 BC to c AD 300), edited by G.C. Pande, ICPR/Centre for Studies in Civilizations, New Delhi, 2001, pp. 413-437; ArXiv: physics/0310001.
Kak, S C"Greek and Indian cosmology: review of early history." In The Golden Chain. G.C. Pande (ed.). CSC, New Delhi, 2005; ArXiv: physics/0303001.
Kak, SC"Babylonian and Indian astronomy: early connections." In The Golden Chain. G.C. Pande (ed.). CSC, New Delhi, 2005; ArXiv: physics/0301078.
Kak, SC "Yajnavalkya and the origins of Puranic cosmology." Adyar Library Bulletin, vol 65, pp. 145-156, 2001; ArXiv: physics/0101012.
Kak, SC "On Aryabhata's planetary constants." Annals Bhandarkar Oriental Research Institute, vol. 84, pp. 127-133, 2003. ArXiv: physics/0110029.
Kak, SC"The speed of light and Puranic cosmology." ArXiv: physics/9804020.
Kak, SC"The golden mean and the physics of aesthetics." ArXiv: physics/041119.
Kak, SC "Akhenaten, Surya, and the Rgveda." In The Golden Chain .G.C. Pande (ed.). CSC, New Delhi, 2005.
Kak, SC"Mendeleev and the periodic table of elements." Archive: physics/0411080
Kak, SC"Greek and Indian cosmology: review of early history." Arxiv: physics/0303001
Kak, SC "The astronomy of the age of geometric altars," Quarterly Journal Royal Astronomical Society, 36, 385-396, 1995
Kak SC, "Knowledge of planets in the third millennium BC," Quarterly Journal Royal Astronomical Society, 37, 709-715, 1996.
Kak, SC"On the science of consciousness in ancient India," Indian Journal of the History of Science, 32, 105-120, 1997.
Kak SC, "Archaeoastronomy and literature," Current Science, 73, 624-627, 1997.
Kak S C"Speed of light and Puranic cosmology." ArXiv: physics/9804020.
Kak, S C"Early theories on the distance to the sun." Indian Journal of History of Science, vol. 33, 1998, pp. 93-100. ArXiv: physics/9804021.
Kak, SC "The solar numbers in Angkor Wat." Indian Journal of History of Science, vol. 34, 1999, pp. 117-126. ArXiv: physics/9811040.
Kak, "Concepts of space, time, and consciousness in ancient India." ArXiv: physics/9903010.
Kak, S C 'Astronomy and its role in Vedic culture." In Science and Civilization in India, Vol. 1: The Dawn of Indian Civilization, Part 1, edited by G.C. Pande, ICPR/Centre for Studies in Civilizations, New Delhi, 2000, pp. 507-524.
Kak, SC On Aryabhata's planetary constants. ArXiv: physics/0110029.
Kak, SC "The cyclic universe: some historical notes." ArXiv: physics/0207026
Kak, S C "Greek and Indian cosmology: review of early history." ArXiv: physics/0303001.
Kak, S C "Babylonian and Indian astronomy: early connections." ArXiv: physics/0301078. Kak S C, "Yajnavalkya and the origins of Puranic cosmology." Adyar Library Bulletin, vol 65, pp. 145-156, 2001. Also in ArXiv: physics/0101012.
Kak, Astronomy in the Vedic altars and the Rgveda, Mankind Quarterly, vol. 33, 1992, pp. 43-55.
Kak S C Indus and Brahmi: further connections, Cryptologia, vol. 14, 1990, pp. 169-183.
Kak, S C The sign for zero, Mankind Quarterly, vol. 30, 1990, pp. 199-204.

Kak, S C Some early codes and ciphers, Indian J. History of Science, vol. 24, 1989, pp. 1-7.
Kak, SC The Brahmagupta algorithm for square rooting, Ganita Bharati, vol 11, 1989, pp. 27-29.
Kak, S C Indus writing, Mankind Quarterly, vol. 30, 1989, pp. 113-118.
Kak, SC The Aryabhata cipher, Cryptologia, vol. 12, 1988, pp. 113-117.
Kak, SC A frequency analysis of the Indus script, Cryptologia, vol. 12, 1988, 129-143.
Kak, S CThe use of determinatives in NLP, AI Magazine, vol. 9, pp. 10-12, Summer 1988.
Kak, S CThe Paninian approach to natural language processing, Int. Journal of Approximate Reasoning, vol. 1, 1987, 117-130.
Kak, S C The study of the Indus script, Cryptologia, vol. 11, 1987, pp. 182-191.
Kak S C , On the decipherment of the Indus script, Indian Journal of History of Science, vol. 22, 1987, pp. 41-62.
Kak S C, On astronomy in ancient India, Indian Journal of History of Science, vol. 22, 1987, pp. 205-221.
Kak S C, On chronology of ancient India, Indian Journal of History of Science, vol. 22, 1987, pp. 222-234.
Kak, SC Computational aspects of the Aryabhata algorithm, Indian Journal of History of Science, vol. 21, 1986, pp. 62-71.
Kak S C, The roots of science in India, India International Centre Quarterly, vol. 13, 1986, pp. 181-196.
Kak S C, The Nature of Physical Reality. Peter Lang, New York, 1986
Kak, "The sun's orbit in the Brahmanas." Indian Journal of History of Science, vol 33, 175-191, 1998.
Kak. An interesting combinatoric sutra. Indian Journal of History of Science, vol. 35, 2000, pp. 123-127.
Kak, Indian binary numbers and the Katapayadi notation. Annals of the BORI, vol. 81, 2000, pp. 269-272.
Kak, The solar equation in Angkor Wat. Indian Journal of History of Science, vol. 34, 1999, pp. 117-126.
Kak, A chronological framework for Indian culture. Journal of the Indian Council of Philosophical Research. 2000, pp. 1-24.
Kak, Indic language families and Indo-European. Yavanika. no. 6, 1996, pp. 51-64.
Millar and S. Kak, A Brahmanic fire altar explains a solar equation in Angkor Wat. Journal of the Royal Astronomical Society of Canada. vol. 93, 1999, pp. 216-220.
Kak, The orbit of the sun in the Brahmanas. Indian Journal History Science, vol. 33, 1998, pp. 175-191.
Kak, Three old Indian values of pi. Indian Journal History Science, vol 32, 1997, 307-314.
Kak, Knowledge of planets in the third millennium BC. Quarterly Journal of the Royal Astronomical Society, vol. 37, 1996, pp. 709-715.
Kak, An Indus-Sarasvati signboard. Cryptologia, vol. 20, 1996, pp. 275-279.
Kak, The astronomy of the age of geometric altars. Quarterly Journal of the Royal Astronomical Society, vol. 36, 1995, pp. 385-396.
Kak, From Vedic science to Vedanta. The Adyar Library Bulletin, vol. 59, 1995, pp. 1-36.
Kak, The Astronomical Code of the Rigveda, Current Science, vol. 66, 1994, pp. 323-326.
Kak, The Astronomical Code of the Rigveda, Puratattva: Bulletin of the Indian Archaeological Society, Number 25, 1994/5, 1-20.
Kak, Annals of the Bhandarkar Oriental Research Institute, vol. 75, 1994, pp. 185-195.
Kak, Astronomy of the Vedic altars, Vistas in Astronomy, vol. 36, 1993, pp. 117-140.
Kak, The structure of the Rgveda, Indian Journal of History of Science, vol. 28, 1993, pp. 71-79.
Kak, Planetary periods from the Rigvedic code, Mankind Quarterly, vol. 33, 1993, pp. 433-442.
Kak and David Frawley, Further observations on the Rigvedic code, Mankind Quarterly, vol. 33, 1992, pp. 163-170.
Kak, Astronomy in Satapatha Brahmana, Indian Journal of History of Science, vol 28, 1993, pp. 15-34.
Kak, The Indus tradition and the Indo-Aryans. Mankind Quarterly, vol. 32, 1992, pp. 195-213.
. Kak, Early art and architecture. Migration and Diffusion -- An international journal. vol 6, 2005, pp. 6-27.
Kak, The Vedic Religion in pre-Zoroastrian Persia, Adyar Library Bulletin, vol. 67, pp. 47-63, 2003
Kak, Babylonian and Indian Astronomy. Physics Archive, Jan 2003, also in "The Golden Chain" G.C. Pande (editor), 2005.
Kak, Early Indian music. In "A Search in Asia for a New Theory of Music," Jose S. Buenconsejo (editor), Center for Ethnomusicology, Univ of Philippines, 2003; pages 59-76.

Kak, Space and cosmology in the temple. Vaastu Kaushal, International Symposium on Science and Technology in Ancient Indian Monuments. New Delhi, Nov 16-17, 2002.
Kak, The idea of 22 shrutis. Sandhan, vol. 1, pp. 69-79, 2001.
Kak, The gods within: on the Vedic understanding of mind and neuroscience, The Adyar Library Bulletin, vol. 64, 2000, pp. 7-55. \.
Kak S C. “Three interesting comet sightings in 15th and 16th century Kashmiri chronicles.” Arxiv: physics/0309113
Kangle R P, The Kautilıya Arthasastra. Motilal Banarsidass, 1986.
Kane, P.V., History of Dharma Sästra, Vol. V, Pt. II, Bhandarkar Oriental Research Institute, Poona, 1958.
Kanigel, Robert, The Man Who Knew Infinity (A Life of the Genius Ramanujan), Rupa & Co., 1992.
Ketkar, V.8., Indian and Foreign Chronology, Bombay, 1923.
Morris Kline “Mathematical thought from ancient to modern times “, Oxford, 1972, p.190
Kochhar, Rajesh and Narlikar, Jayant, Astronomy in India, A Perspective, INSA, New Delhi, 1995.
Alok Kumar, PhD What Eleventh-Century Spain Knew About Indian Science and Math
Kramrisch, S. The Presence of Siva. Princeton University Press, Princeton 1981.
Translations
Kuppanna Sastry, T.S., Vedanga Jyotisha of Lagadha. Indian National Science Academy, Delhi 1985.
Kuppanna Sastry, T.S., Panchasiddhantika by Varahamihira
Kuppanna Sastry, T.S., Collected Papers on Jyotisha, Kendriya Sanskrit Vidya Peetha, Tirupati, 1989.
Lal, B B The Earliest Civilization of South Asia. Aryan Books International, New Delhi, 1997.
Lal, B B The Sarasvati Flows On. Aryan Books International, New Delhi, 2002.
N.N. Law. 1965. Age of the Rgveda. Calcutta: Firma K.L. Mukhopadhyay
Lishk, S.S., Jaina Astronomy, Delhi, 1987.
Matilal B K , Nyaya-Vaisesika. Otto Harrassowitz, Wiesbaden, 1977.
Potter Karl (ed.). Indian Metaphysics and Epistemology. Princeton University Press, Princeton, 1977.
P.K. Majumdar, A Rationale of Brahmagupta's Method. Indian Journal of History of Science 16, 111-117, 1981.
Naik, P.C. and Satpathy, L., Samanta Chandrasekhar: Life and work, Current Science, Vol. 69, no. 8, Bangalore, 1995.
Narahari Achar, B N 1998. Enigma of the five-year yuga of Vedanga Jyotisa, Indian Journal of History of Science, 33, pp. 101-109.
Narahari Achar, B N 2000. On the astronomical basis of the date of Satapatha Brahmana, Indian Journal of History of Science, 35, pp. 1-19.
Narahari. Achar,B N “On the Vedic origin of the ancient mathematical astronomy of India.” Journal of Studies on Ancient India, 1: 95-108, 1998.
Narahari Achar,B N “A case for revising the date of Vedanga Jyotisa,” Indian Journal of History of Science, vol. 35, pp. 173-183, 2000.
Neugebauer, 0., A History of Ancient Mathematical Astronomy, (in 3 Parts), Springer-Verlag, 1975.
Pande G C (ed.), The Dawn of Indian Civilization. Centre for Studies in Civilizations, New Delhi, 2000.
Pearce, I Indian mathematics: redressing the balance. http://www-history.mcs.st-andrews.ac.uk/history/Projects/Pearce/index.html
Pingree, D., Jyotihsastra, A History of Indian Literature, Edited, by Jan Gonda, Vol. VI, Fasc.4, Otto Harrassowitz, Wesbaden, 1981.
Pingree, D., The Yavanajataka of Sphujidhvaja, Vol.1, Edited, Translated, and Commented on, Harvard Univ. Press, Cambridge, Mass., 1978.
Pingree, David. 1978. A History of Mathematical Astronomy in India. Dictionary of Scientific Biography, vol. 15, pp. 533–633, Suppltment 1, New York: Charles Scribner's Sons. 1978
Rajagopal, C.T. and Venkataraman, A., The Sine and Cosine Power Series in Hindu Mathematics, with an Addendum by KM. George, J. of Asiatic Soc. of Bengal, 3rd Series, 15, pp. 1-13, 1949.
Rajagopal, C.T. and Aiyar, T.V. Vedamurthy, On the Hindu Proof of Gregory Series, Scripta Mathematica, 17, nos. 1-2, pp. 65-74, 1951.

C.T. Rajagopal and M.S. Rangachari, On an Untapped Source of Medieval Keralese Mathematics. Archive for History of Exact Sciences 18, 89-102, 1977-8. .
C.T. Rajagopal and M.S. Rangachari, On Medieval Keralese Mathematics. Archive for History of Exact Sciences 35, 91-99, 1986.
Raju, C.K., 'Computers, mathematics education, and the alternative epistemology of the calculus in the Yuktibhâsâ', Philosophy East and West 51, University of Hawaii Press, 2001.
Ramanujan, Srinivasa, Collected Papers of Srinivasa Ramanujan, Edited G.H. Hardy, P.V. Seshu Iyer, and B.M.Wilson, Cambridge University Press, 1927.
Ramasubramanian, K., Srinivasa, M.D. and Sriram, M.S., Modification of the earlier Indian Planetary theory by the Kerala
astronomers and the implied heliocentric picture of plane work tary motion, Current Science, 66, pp. 784-790.,May 1994.
M.S.Sriram;K. Ramasubramanian;M.D. Srinivas
Shimla : Inter-University Centre for Indian Institute of Advanced Study , 2002
Five hundred years of tantrasangraha : A landmark in the history of astronomy : Proceedings of the conference organized by the Department of Theoretical Physics, University of Madras during March 11-13, 2000, to celebrate the 500th anniversary of : The volume is a compilation of the important papers presented at this conference, ISBN 81-7986-009-4,52(091)
Ranganathan, S.R., Ramanujan - The Man and the Mathematiclan, Asia Publishing House, Bombay, 1967.
T.R.N. Rao and S. Kak. Computing Science in Ancient India. Munshiram Manoharlal, New Delhi, 2000.
Sachau EC , Alberuni’s India. Low Price Publications, Delhi, 1989 (1910).
Saraswathi Amma, TA., Geometry in Ancient & Medieval India,
Motilal Banarsidass, Delhi, 1979.
Saraswathi, T.A., The Development of Mathematical Series in
India after Bhaskara II, Bulletin of the National Inst., of Sc.
in India, 21, pp. 320- 43, 1963.
Sarma, K.V., A History of the Kerala School of Hindu Astronomy (In Perspective), Vishveshvaranand Inst., Hoshiarpur, 1972.
Sarma , K. V.,(1993) Research in Sanskrit, Kuppuswami sastry Research Institute, Adarsha Sanskrit Shodha Samastha, Madras 60000
Seal, B The Positive Sciences of the Hindus. Motilal Banarsidass, Delhi, 1985 (1915)
Seidenberg, A“The origin of geometry.” Archive for History of Exact Sciences. 1: 488-527, 1962.
Seidenberg, A “The origin of mathematics.” Archive for History of Exact Sciences. 18: 301-342, 1978.
Selenius, Clas-Olof, Rationale of Chakravala Process of Jayadeva and Bhaskara II, Histona Mathematica, 2, 1975.
Sen, S.N., Bag, A.K. and Sarma, S.R., A Bibliography of Sanskrit works on Astronomy and Mathematics, Part I, National lnst. of Sciences of India, New Delhi, 1966.
Sen, S.N. and Shukla, K.S. (Edited,) History of Astronomy in India, l.N.S.A., New Delhi, 1985.
S.N. Sen, “Surveys of Studies in European Languages.” Indian Journal of History of Science, vol 20, 49-121, 1985.
Sen, S. N. 1971 Astronomy. In A Concise History of Science in India. Edited by D. M. Bose, S. N. Sen and B. V. Subbarayappa, pp. 58-78. Indian National Science Academy, New Delhi.

de Santillana and von Dechend: Hamlet's Mill. Gambit, Boston 1969.
Sengupta, P.C. Ancient Indian Chronology. Calcutta: University of Calcutta Press, 1947.
Sen, S.N., and K.S. Shukla, eds. 1985. History of Astronomy in India. New Delhi: Indian National Science Academy.
Sri Yukteswar Giri. The holy science. Los Angeles, Ca: Self-Realization Fellowship, 1984.
K.S. Shukla and K.V. Sarma, Aryabhatıya of Aryabhata. New Delhi: Indian National Science Academy, 1976.
Sengupta, P.C., Aryabhata, the Father of Indian Epicyclic Astronomy, J. of Dept. of Letters, Uni. of Calcutta, 1929, pp.1-56.
Sharma, Virendranath, Zij-i Muhammad Shähi and Tables of De
La Hire, IJHS, 25(1-4), New Delhi, 1990.

Shea, D and A. Troyer, The Dabistan or School of Manners. M. Walter Dunne, Washington and London, 1901.
Shastri, Ajay Mitra, Vikrama Era and S aka Era, IJHS, 31(1), New Delhi, 1996.
Smith, D.E., History of Mathematics, Dover Pubn., 1958. Smith D.E.,, ,and Karpinsky, L.C. "The Hindu Arabic Numerals" Boston, ,Ginn & Co., 1911
Somayaji, D.A., A Critical Study of Ancient Hindu Astronomy, Karnataka University, Dharwar, 1971.
Srinivas, M.D., Indian Approach to Science :The case of JyotihsasIra, P.P.S.T. Bulletin, Nos. 19-20, June 1990.
Srinivas M.D., Proofs in Indian Mathematics , published also in G Emch , R Sridharan and M D Srinivas "Contributions to the History of Indian Mathematics" Hindustan Book agency, New Delhi, 2003
Srinivas, M D., The Indian tradition in Science and technology, Center for Policy Studies New No.6, old number 29, Balaiah Avenue,Luz corner, Mylapore, Chennai, 600004
S. Srinivasan, Evolution of Weights and Measures in Ancient India. Ganita-Bharati 4, 17-25, 1982.
Srinivasiengar, C.N., The History of Ancient Indian Mathematics, The World Press Private Ltd., Calcutta, 1967.
Sriram, M.S., Man and the Universe (To be published), Dept. of Theoretical Physics, Uni. of Madras, Guindy Campus, Madras, 1993.
Staal, Fritz "Greek and Vedic geometry," Journal of Indian Philosophy, 27: 105-127, 1999. T.A. Sarasvati, Geometry in Ancient and Medieval India. Indological Publ., Delhi, 1979.
Staal,Fritz Euclid and Panini. Philosophy East and West, 15, 99-106, 1965. .
Fritz. Staal, The Sanskrit of Science. Journal of Indian Philosophy, 23, pp. 73-127, 1995.
Subbarayappa, B.V. and Sarma, K.V., Indian Astronomy, A Source-Book, Nehru Centre, Bombay 1985.
Swarup, G., Bag, A.K. and Shukia, K.S., Historyof Oriental Astronomy, Cambridge University Press, Cambridge, 1987.
Thurston, H Early Astronomy. New York: Springer-Verlag, 1994
Tilak, Bal Gangadhar: The Orion or Researches into the antiquities of the Vedas, The arctic home in the vedas, Vedic Chronology and Vedanga Jyotisha. Poona: Messrs Tilak Bros.
B. van Nooten, "Binary numbers in Indian antiquity", Journal of Indian Philosophy, 21, 31-50, 1993.
Vidyabhusana, S C The Nyaya Sutras of Gotama, revised and edited by Nandalal Sinha. Motilal Banarsidass, Delhi, 1990.
Vidyabhusana, S C A History of Indian Logic. University of Calcutta, Calcutta, 1921.
Vidyalankara, V. Satapatha Brahmanastha Agnicayana Samiksa. Bahalgarh, 1985.
B.L. van der Waerden, "The great year in Greek, Persian and Hindu astronomy." Archive for History of Exact Sciences, vol 18, 359-384, 1978.
B.L. van der Waerden, "Two treatises on Indian astronomy." Journal for History of Astronomy vol 11: 50-58, 1980.
C M Whish "On the Hindu Quadrature of the circle, and the infinite series of the proportion of the circumference to the diameter exhibited in, the the Four Shastras, Tantrasangraham, Yuktibhasha, , Karana Paddhati and Sadratnamala, Transactions of the Royal Asiatic society(GB) 3,509-523,1835. However Whish does not seem to have published any further paper on this topic.
Vedic Samhitas Kulkarni, R.P. 1983, Geometry according to the Sulba Sūtras, Pune, India; Vaidic Samshodhan Mandala, (ed) Sontakke.
Neugebauer, 1951, The exact sciences in antiquity, Coperhagen.
Sontakke N.S. and Kashikar C.G., "Rig Veda Samhita", Vaidic Samshodan Mandala
Burk, Albert 1901, Das Apastamba Sulba Sūtra
Zeitschrift D.M.G vol 55, 543-91
Datta, B.B., 1932, Science of Sulbas, reprinted by Cosmo, New Delhi
Shatapatha Brāhmaṇa, Pub: Research Institute for ancient Scientific studies
Bose, D.N., etal, 1971, A concise history of Science in India, Indian National Science Academy, New Delhi
N.K. Jha, 1996, Vedic glossary on Indus Seals seah, Ganga Kaveri Pub. House, D. 35/77, Janganwadimath, Varaṇasi, 221001, India
Rajaram N.S. and Frawley D. 1997 "Vedic Aryans and the origins of civilisation", Voice of India, New Delhi
Balachandra Rao S. 1994, Indian Mathematics and Astronomy, Some Landmarks, National College, Basavanagudi, Bangalore 560004.

R. L. Kashyap and M. R. Bell, “Error-correcting Code-like chanting procedures in ancient India,” available from the first author.
Rg Veda, various mandalas, much of the information is encoded in the numerology associated with the Rg andis accessible only to those willing to make the effort to decipher the message.
Yajur Veda, XXX,10
Chaandogya Upanishad, 1.2.4;2.1;7.1
The Grihya Sutras
Sankhayana Aaranyaka
Taittreya Braahmana
Sulva sutra era
And other Vedangas S.N. Sen and A.K. Bag, Sulba-Sutras (Baudhäyana, Apastambha, Katyayana and Manava) 1989.Text, Translated and Commentary. I.N.S.A., New Delhi 1983,
B Datta, The science of the Sulba (Calcutta, 1932).
G G Joseph, The crest of the peacock (London, 1991).
R C Gupta, New Indian values of PI from the Manava sulba sutra, Centaurus 31 (2) (1988), 114-125.
R C Gupta, Baudhayana's value of square root of 2, Math. Education 6 (1972), B77-B79.
S C Kak, Three old Indian values of PI, IJHS. 32 (4) (1997), 307-314.
R P Kulkarni, The value of PI known to Sulbasutrakaras, Indian J. Hist. Sci. 13 (1) (1978), 32-41.
G Kumari, Some significant results of algebra of pre-Aryabhata era, Math. Ed. (Siwan) 14 (1) (1980), B5-B13.
A Mukhopadhyay and M R Adhikari, The concept of cyclic quadrilaterals : its origin and development in India (from the age of Sulba Sutras to Bhaskara I, Indian J. Hist. Sci. 32 (1) (1997), 53-68.
A E Raik and V N Ilin, A reconstruction of the solution of certain problems from the Apastamba Sulbasutra of Apastamba (Russian), in A P Juskevic, S S Demidov, F A Medvedev and E I Slavutin, Studies in the history of mathematics 19 "Nauka" (Moscow, 1974), 220-222; 302.
Cooke, R. 2005. The History of Mathematics: A Brief Course. Wiley-Interscience. 632 pages. ISBN 0471444596. page 200.
Seidenberg, A. 1983. "The Geometry of the Vedic Rituals." In The Vedic Ritual of the Fire Altar. Ed. Frits Staal. Berkeley: Asian Humanities Press.



(7854 words)

Appendix F

Sources of Sanskrit Manuscripts In India

Tamilnadu	
Chennai	Govt. Oriental Mss. Library
Chennai	Dr. U.V.S.I. Library
Chennai	Ramakrishna Mission
Thanjavur	TMSSM Library
Chennai	Kingdom of Trivandrum
Kanchipuram	Kingdom of Trivandrum
Kanchipuram	Sri Kanchi Sankar Math
Madurai	Saurashtra Sabha
Chennai	Kupuswami Sastri Res. Institute
Chennai	Adyar Library and Research Centre
Annamalai Nagar	Annamalai University Library
Thanjavur	Tamil University (Dept. of epigraphy)
Thanjavur	Tamil University (Dept. of His. & rare paper Mss.)
Thanjavur	Tamil University (Dept. of Palm leaf Mss.)
Madurai	Govt. Museum
Chennai	Institute of Asian Studies
Kanchipuram	Madurai Province Jesuit Archives

Shrothium Navalpakkam	**Nyaya Mimamsa Anusandhan Kendra**
Madurai	**Madurai Kamraj University**
Shrotium Navalpakkam	**Sri Hayagriva Mahala Library**
Thanjavur	**Karandai Tamil Samgam**
Mayauram	**Vasudeva Brahmendra Saraswati Library**
Madurantakam	**Ahobila Mutt Sanskrit College**
Madurai	**The Rameswaram Devasthanam Pathasala**
Kanchi Conjivaram	**The Upanishad Brahma Mutt**
Sriperambudur	**The Ubhayavedanta Sanskrit College**
Srirangam	**The Srirangam Devasthanam Library**
Chennai	**Fort St. George Museum**
Chennai	**International Institute of Tamil Studies**
Madurai	**School Historical Studies, Madurai Kamaraj University**
Maharashtra	
Nagpur	**Nagpur University Library**
Pune	**Bharata Itihasa Samsodhaka Mandala**
Pune	**Anandashram Sanstha**
Pune	**Bhandarkar Ori. Res. Institute**
Pune	**Vaidika Samsodhan Mandala**
Mumbai	**Jama Masjid Trust Library**
Mumbai	**Asiatic Society**

Mumbai	**Bombay University**
Mumbai	**Maharastra State Archieves**
Kohlapur	**Shivaji Universiry (BARR) Balasaheb Khandekar Library**
Poona	**Poona Universiry, Laykar Library**
Mumbai	**Smt. Nathi Bai Damodar Thakarsey women's University Library**
Nagpur	**Anthropological Survey of India LIbrary (Central)**
Pune	**The Mandalik Library, Fergussion College**
Nasik	**The Hamsaraj Pragji Thakersey College**
Raipur	**Rajpur Sanskrit Pathsala**
Nagpur	**Jamia Arabia Islamia**
Bombay (Colaba)	**Anantacharya Indolofical Research Institute**
Bombay	**Bhartiya Vidya Bhawan**
Bombay	**Bhartiya vidya Bhawan**
Shirur	**Vhandmal Tarachand Bora College**
Beed (Ambajogai)	**Dasopant Samsodhan Mandal**
Pune	**Deccan College Post Graduate & Research Institute**
Nasik	**HPT Arts & RYK Science College**
Thane	**Institute for Oriental studies**
Dhule	**IBK Rajwade Samsodhan Mandal**
Bombay	**KR Cama Oriental Institute**
Yavatmal, Arni Road	**Shardashram**
Amravati	**Sri Samrthi Vagdevata Mandir**

Dhule	**Sri Samarthi Vagdevata Mandir**
Mumbai	**Asiatic Society of Bombay**
Nagpur	**The Bhonsala Veda Shastra Mahavidyalaya**
Yeotmal	**C P andBerar Jain Research Institute**
Mumbai	**Forbes Gujarati Sabha, Vithalbhai Patel Rd.**
Mumbai	**Heras Institute of India History and Culture, St. Xavier's college**
Mumbai	**Marathi Samsodhan Mandal, marathi grantha Sangrahalaua, Thakurdwar**

Karnataka	
Hubli	S.J.M.Math
Dharmshala	Jai Basadi Moodbidri
Mangalagangotri	Mangalore University Library
Bangalore	Central Power Research Institute Library
Dharwad	Karnataka Historical Research Society
Melkote	Academy of Sanskrit Research
Moodbidri	Sri Vira Vani Vilasa Jain Sinddhanta Bhawan
Moodbidri	The Danasala Matha Sastra Bhandara
Bangalore	Sri Chamarajendra Sanskrit College Chamrajpeth
Tumkur	Sri Siddhanlingeswer Sanskrit Colege and Veda Pathsala, Siddhanganga
Melkote, Pandavapura	Sanskrit College, Manday
Mysore	The Parakala Mutt Library
Udipi	M G M College
Udipi	Mutt of Sri Madhvacharya Sansthan
Karkala	Jaina Mutt
Udipi	Sri Krishna Mutt
Udipi	The Pejawar Mutt
Mysore	The Palace saraswati Bhandar, Maha. Skt Coll.
Sravanavelagola	Srimaccarukirti Panditacarya Jain Bhandar
Sringeri	The Sharada Pitha. The Mutt H.H. Swami

Sringeri	**Sankara Narayana Jyautisika**
Bangalore	**Kannada Sahitya Parishat**
Mysore	**Maharaja Sanskrit College**
Mysore	**Mysore Sanskrit Academy**
Udupi	**S M S P Sanskrit College**
Melkote	**Vedavedantebodhini Sanskrit College**
Dharwad	**Karnataka University, Dept. of Skt, History (Post graduate teaching)**
Gulbara	**Institute of Kannada Studies (Gulbara University)**
Dharwad	**Institute of Kanada Studies (University of Karnakta)**
Bangalore	**Bangalore University Library**
Bangalore	**Kalpataru Research Academy**
Dharmasthala	**Sri Manjunatheswar Cultural & Research Institute**
Dharwar	**Vidyadhisha Sanskrit manuscript Library**
Mysore	**Oriental Research Institute**
Bangalore	**United Theological College**
Kerala	
Keladi	**Keladi Museum & H R B**
Trivandrum	**O. R. I & Messs. Library**
Trivandrum	**The state Archieves of Kerala**
Tripunithura	**Sri Ram Verma Govt. Skt. College**
Cochin	**Central Inst. of Fisheries Techno. Library**
Trichur	**Rama Verma Research Institute, Town Hall**

Kasaragod	Edneermath
Kottayam	Kottayam Public Library
Calicut	Manuscript Library (Deptt, of Malayalam) University of Calicut
Calicut	Calicut University Library
Palghat	Chandraprabha Digambara Jain Basti
Thiruvanantapuram	Kerala Granthasala Sandham
Palghat	Palghat educational & Cultural Council

Delhi	
New Delhi	National Archieves
New Delhi	Indian Council of Cultural Relation, Azad Bhawan.
New Delhi	National Museum
Delhi	Delhi Archieves
New Delhi	Delhi University Library
New Delhi	ICSSR, Social Science Documentation Centre
New Delhi	Indian Institute of Islamic Studies
New Delhi	Raja Rammohan Roy National Educational Resources Centre Library
New Delhi	Sri Ram Centre for Indusrial Relations & Human Resources Library
Delhi	Mahabir Jain Pustakalaya
Delhi, Timarpur	Bharatiya Vidya Sansthan (Inst. of Indology)
Delhi	Madarsa Aminiya
New Delhi	Dr. Zakir Husain Library (Jamia Milia Islamia)
New Delhi	International Academy of Indian Culture, Haus Khas Enclave

Alipur, Delhi	**Bhogilal Lehrchand Research Institute**
Delhi	**Dargah hazrat Shah Abul Khair**
New Delhi, Nizamuddin	**Galib Academy**

Andhra Pradesh	
Hyderabad	**Andhra Pradesh Govt. Oriental Mss. Lib. and Research Institute**
Tirupati	**Sri Venkateswar oriental REs. Institute**
Hyderabad	**Salar jung Museum Liberary**
Hyderabad	**Kutub Khana-I-Saidiya**
Hyderabad	**Jamia Nirzamia**
Hyderabad	**Abul Kalam Azad Oriental Res. Institute**
Hyderabad	**Archival Cell (Dept. of History**
Hyderabad	**Birla Archaeological and Cultural Res. Inst**
Hyderabad	**City Central Library**
Hyderabad	**Osmania University Reginal Library**
Rajahmundry	**Sri Gowthami Reginal Library**
Rajahmundry	**Sri Rallabandhi Subbarao Archeological Museum**
Vishakhapatanam (Waltair)	**Andhra University Library, Dr. V S Krishma Library**
Rajahmundry	**Andhra Historical Research Society**
Vishakjpatanam	**Arsha Library**
Hyderabad	**Oriental Public Bureau and Dairat Ul Maarif**

Chitoor	**Samskrita Bhasha Pracharini Sabha**
Kakinada (Ramraspet)	**Telugu Academy**
Hyderabad	**Sanskrit Academy, Osmania University**
Hyderabad	**Henery martyn Institute of Islamic Studies**
Hyderabad	**The state Archieves of Andhrapradesh**
Bhattanavalli	**The sanskrit press and Publications**
Aukiripalli, Krishna	**Sri Markandeya Sanskrit College**
Guntur	**Sri Sharada Niketanam**
Vijayanagaram	**Maharaja's Govt. Sanskrit College**
Nellore	**Veda and Sanskrit College**
Tirumala	**T T D Veda Pathashala**
Vetapalem	**Saraswata Niketan**
Vizianagaram	**The Vizianagaram Fort**

The following astronomical observatories have varying quantities of manuscripts related to ancient astronomy in India

Source http://www.cs.utexas.edu/users/mitra/astro.html

Observational Astronomy through the ages in India

Stone Observatories of Jai Singh

Sawai Jai Singh (1686-1743) constructed five observatories in India at Delhi, Jaipur, Benaras, Ujjain, and Mathura. The one in Mathura no longer exists. The observatories in Benaras and Ujjain are in a state of disrepair. In these observatories Jai Singh installed astronomical instruments of pre-telescopic era. Some of the instruments were

made out of metal but most were constructed of masonry. Many of the instruments were Jai Singh's own invention such as Jai Prakasa Yantra, Rama Yantra, and Samrat Yantra. Jai Singh was aware of the existence of telescopes but the ones that come into his hands were poor in quality, suffering from defects like spherical and chromatic aberrations. He opted for instruments made out of stone and masonry. Jai Singh produced a set of astronomical tables completed sometime between 1727 and 1735. The tables were called ZIJ-I MUHAMMAD SHAHI - the astronomical tables of Muhammad Shah, the reigning monarch at that time.

Madras Observatory

The old Madras Observatory was established by the East India Company in 1792. The guiding force behind the construction of this observatory was Michael Topping a sailor-astronomer. He acquired several astronomical instruments, some from William Petrie a noted English astronomer. Among the instruments that he had were achromatic refractors, astronomical clocks with compound pendulum, and an excellent transit instrument. The observing program included stars, the Moon, and eclipses of Jupiter's satellites. For more than a century measurements of stellar positions and brightnesses were made. During this period several Government astronomers headed the observatory. Notable among them were Goldingham, Taylor, Jacob, and Pogson. The last astronomer was well known for the Pogson's scale in photometric work. At the end of the nineteenth century the Kodaikanal observatory was constructed which subsumed the role of the Madras observatory. From then onwards the Madras observatory had a side role in weather forecasting and time service.

Calcutta Observatory

A small observatory was established in Calcutta by the East India Company around 1825 to serve the Survey Department. It had a transit telescope, alti-azimuth circle and later an astronomical telescope was added. Some astronomical observations were performed of lunar transits and eclipses of Jupiter's satellites, but mostly it was confined to routine time recording and meterological observations.

Royal Observatory at Lucknow

King Nasiruddin Haydar, who reigned in Oudh, established an observatory in Lucknow during 1832. According to some reports it was one of the best equipped observatories in India at that time. It had a mural circle, a transit telescope, an equatorial telescope, and astronomical clocks. Maj. Richard Wilcox was in charge of the observing program. Wilcox and his assistants observed the major planets, the larger asteroids like Ceres and Vesta, eclipses of Jupiter's satellites, occultations of stars by the Moon, and meridonial transit of stars. After Wilcox's death the observatory was closed due to political reasons and was destroyed during the Indian War of Independence in 1857.

Travancore Observatory

In 1836, the Raja of Travancore had an observatory built in Trivandrum. He appointed John Caldecott as its director. For the observatory, Caldecott acquired a transit instrument, two mural circles, an equatorial telescope,

and magnetic and meteorological instruments. He collected an enormous amount of astronomical data, which included the observations and computations of the orbital elements of the comets of 1843 and 1845. After Caldecott's death the next notable director was John Broun. But Broun's interest was mainly in meteorology and terrestrial magnetism. Broun is associated with the discovery of the relationship between solar activity and subsequent changes in terrestrial magnetism. After Broun's departure in 1865 the observatory was closed by the then Raja of Travancore.

Takhta Singhji Observatory

Owing to the efforts of a Parsi physicist, K. D. Naegamvala, an observatory was established in Pune around 1882 through a grant from the Maharaja of Bhavnagar. The observatory had a 20-inch Grubb reflector for both visual and photographic work, spectroscopes, and sidereal clocks. It was a premier spectroscopic observatory in India. Naegamvala made spectroscopic observations of the solar chromosphere and corona during the solar eclipse of 1898. He also made spectroscopic studies of the Orion nebula and sunspot groups. After Naegamvala's retirement in 1912 the observatory was dismantled and the instruments were transferred to the fledgling observatory in Kodaikanal.

Miscellaneous Observatories

In 1875, Father Lafont established a spectroscopic laboratory in St. Xavier's College, Calcutta in order to carry out solar and stellar spectroscopic work. The observatory had equatorial telescopes, transit instruments, and spectroscopes. Observations of solar prominences were carried out regularly. Later the focus of the observatory was shifted to meteorological work. Currently, the observatory is being used only for teaching purposes.

Mention must also be made of the observatory in Presidency College, Calcutta. It was constructed in 1900 through a grant from the Maharaja of Tipperah who donated a 4.5-inch Grubb reflector. In 1922 it received as a gift from the Astronomical Society of India an 8-inch telescope.

Indian Astronomy in the early 20th Century

Kodaikanal Observatory

After the Madras famine of 1886-87, an inquiry commission appointed by the Government recommended that the relation between sunspot activity and the distribution of rains be studied. The site for a solar observatory was selected in Kodaikanal and the observatory started functioning from 1900. Observations of sunspots, solar prominences, and solar photography were carried out on a regular basis from the following year. Spectroscopic

instruments were acquired to obtain the spectra of sunspots and spectro-heliographs of the sun in the lines of ionized calcium and hydrogen. The Kodaikanal and Madras Observatory had the same director. Over the years the role of the Madras Observatory was confined to the measurement of time, but the observations of the sun still continue at the Kodaikanal Observatory.

John Evershed became the director of the Kodaikanal Observatory in 1911. He started a program of photographing solar prominences and sunspot spectra. He noticed that many of the Fraunhofer lines in the sunspot spectra were shifted to the red. He showed that these shifts were Doppler. This discovery came to be known as the Evershed effect. From the nature of the sunspot spectra Evershed concluded that they were similar to stars of spectral type K.

Another discovery of Evershed bears mentioning. While comparing the spectra of the limb of the sun with that obtained from the center of the disk he noticed a shift towards the red at the limb. He first attributed that to motion but when Einstein's gravitational displacement was considered to be a factor, Evershed recomputed his results. His conclusion was that while Einstein's gravitational displacement could account for most of the shift, there still remained a definite unexplained residual shift.

Nizamiah Observatory

A wealthy nobleman in Hyderabad acquired a 15-inch Grubb refractor and established an observatory at Begumpet, Hyderabad. The observatory was taken over by the Nizam's Government in 1908 and it soon became involved in an international program of mapping the sky. In this carte-du-ciel program 18 observatories with similar instruments took part. For this program an 8-inch astrograph was acquired. The observatory was alloted the zone between declinations -17° to -23°. Later it also covered the zone between declinations +39° to +36°, originally given to Potsdam. The observations were carried out under 3 directors - Chatwood, Pocock, and Bhaskaran. Twelve catalogues containing 800,000 stars were published.

T. P. Bhaskaran also started an observing program of variable stars with the 15-inch Grubb telescope. It was during his time that control of the observatory passed from the Nizam's Government to Osmania University. Akbar Ali succedeed Bhaskaran in 1944. Ali started a program of double star measurement. He felt the need to introduce the new study of photoelectric photometry and placed an order for a 48-inch telescope for the observatory.

Astronomy in the Universities

In the first half of the twentieth century most of the observational work was being conducted at Kodiakanal and Nizamiah Observatories. Much of the theoretical work was being done at three centers - Calcutta University, Allahabad University, and Benaras Hindu University.

At Calcutta University, Prof. C. V. Raman attracted a bright group of young physicists. Among them was M. N. Saha. Saha's greatest contribution was in the theory of thermal ionization and its application to stellar atmospheres. Saha moved to Allahabad University and started a strong group on theoretical astrophysics. Several members of this group made important contributions in the field of stellar interiors. Another group inspired by V. V. Narlikar worked on cosmology at the Benaras Hindu University. His son J. V. Narlikar carried on this line of research.

Post Independence Optical Astronomy in India

The main centers for optical astronomy in India are Indian Institute of Astrophysics at Bangalore, Center for Advanced Study in Astronomy at Osmania University, Uttar Pradesh State Observatory at Naini Tal, and Physical Research Laboratory at Ahmedabad.

Indian Institute of Astrophysics, Bangalore

In 1971 the old Madras and Kodaikanal Observatory were made into a single autonomous research institution. The solar observations continued to be performed at Kodaikanal. New instruments had been added over the years - a large solar telescope with a high dispersion spectrograph, a coronagraph, and a monochromatic heliograph. The solar telescope now has a photoelectric magnetograph to make fine measurements of magnetic and velocity fields in the sun. This observatory has sent out several expeditions to observe solar eclipses.

Optical observations of stars and galaxies are conducted from Kavalur in Tamil Nadu. The 20-inch Grubb reflector that was acquired from the Maharaja Takhtasingji Observatory was tranferred from Kodaikanal to Kavalur. After Bappu became the director a 30-inch reflector was added to the observatory for photoelectric photometry. During Bappu's directorship a 2.3 meter telescope was designed and fabricated indigeneously. This telescope is used at prime (f/3.25) and cassegrain (f/13) focii for imaging and medium resolution spectroscopy using CCD detectors. There is also a 1-meter Carl Zeiss telescope used for CCD imaging and low resolution spectroscopy.

Center for Advanced Study in Astronomy, Osmania University

The Nizamiah Observatory, which had 15-inch refractor and a 8-inch astrograph, was under the administration of Osmania University. In 1959 a separate teaching department was started. In 1964 the University Grants Commission recognized the department and its observing facilities as a Centre for Advanced Study in Astronomy. A 48-inch telescope was commissioned in 1968 and installed near the villages of Japal and Rangapur. The center under the directorship of K. D. Abhyankar had an active program in photoelectric photometry and spectroscopic observations of variable stars.

Uttar Pradesh State Observatory, Naini Tal

The government of Uttar Pradesh established an observatory in 1954 at Benaras. It was later shifted to Naini Tal when Vainu Bappu was its Chief Astronomer. Sinvhal, who succeded Bappu, acquired a 1-meter Zeiss telescope.

The observatory also has a 15 inch and a 20-inch reflector with folded Cassegrain and Coude foci for solar work. The observing program includes photoelectric photometry of variable stars, comets, and occultation work. In 1977, during the occultation of SAO158687 by Uranus, observers at Naini Tal detected the ring system around this planet.

Aryabhatta Research Institute of Observational-Sciences (ARIES), Nainital

The 50-year old State Observatory at Nainital was reincarnated on 22nd March 2004 as ARIES, an acronym given for Aryabhatta Research Institute of Observational-SciencES, an autonomous institute under the Department of Science and Technology, Govt. of India. Historically. The Observatory came into existence at Varanasi on 20th April, 1954. The Observatory was later moved from the dust and haze of the plains to more transparent skies of Nainital in 1955, and to its present location in 1961 at an altitude of 1951m at Manora peak, a few km south of the Nainital town.



Physical Research Laboratory, Ahmedabad

There is a 48-inch telescope at Gurushikhar on Mt. Abu. The telescope is operated by the Physical Research Laboratory and is used mainly for infrared work. They have a 256 x 256 pixel HgCd array detector for 2 micron imaging. The observing program includes spectroscopy and polarimetry. PRL also has a solar observatory in Udaipur. It has a 12-ft solar telescope on a small island in the midst of Fateh Sagar Lake. The observatory is involved in high resolution chromospheric and photospheric studies of flares.

Reference

Sen, S.N. and Shukla, K.S., (1985), History of Astronomy in India, Publisher: Indian National Science



(2947 words)

Sources for Sanskrit Manuscripts outside India

Number	Name	Primary Sources Books, and Articles
1.	**Abbreviations**	• **AIAM** Ancient Indian Astronomy and Mathematics • **INSA –**Indian National Science Academy • **IJHS –** Indian Journal of History of science • **CSIR –** Council of Scientific and Industrial Research • **PHISPC** - Project of History of Science, Philosophy and Culture in Indian Civilizations • **ICHR –** Indian Council of Historical Research
2.	**Collection printed catalogues in England**	***Catalogue of the Sanskrit manuscripts in the British Museum.*** **Bendall, C.** **London, 1902.** ***Catalogue of Sanskrit and Prakrit manuscripts in the British Museum vol. II.*** **Losty, J .** **Unpublished typescript. Classed inventory Manuscript register in 2 vols kept in OIOC Reading Room at Or Gen MSS 15** ***Catalogue of the Sanskrit and Prakrit manuscripts in the Library of the India Office.*** **Eggeling, J., Keith, AB, and Thomas, FW.** **London, 1887-1935.** **2 vols.** ***Catalogue of two collections of Sanskrit manuscripts preserved in the India Office Library.*** **Tawney, CH, and Thomas, FW.** **London, 1903.** ***Catalogue of the Nevill Collection.*** **Nevill, H.** **Unpublished manuscript. 4 vols.** ***List of Pali, Sinhalese, Sanskrit and other manuscripts, formerly in the possession of Hugh Nevill Esq.*** **Barnett, L.D.** **1909.** **Unpublished manuscript.**

		Catalogue of the Hugh Nevill Collection of Sinhalese manuscripts in the British Library. **Somadasa, K.D.** **London, 1987-95.** **7 vols.** ***Catalogue of the Pali printed books in the India Office Library.*** **Raper, T.C.H., ed., and O'Keefe, M.J.C., rev.** **London, 1983 .** ***Ancient Buddhist Scrolls from Gandhara: the British Library Kharosthi fragments.*** **Salomon, R.** **London/Seattle, 1999.** ***Preliminary list of manuscripts in languages of Central Asia and Sanskrit, from the collections made by Sir Marc Aurel Stein, KCIE.*** **Barnett, L.D.** **Unpublished typescript (n,d,).** ***Indian charters on copper plates.*** **Gaur, A.** **London, 1975.** ***Catalogue of Sanskrit, Pali and Prakrit Printed Books in the British Museum.*** **Haas, E., Bendall, C., and Barnett, L.D.** **London, 1876-1928.** **4 vols.** ***Catalogue of the Library of the India Office, vol. 2, part 1: Sanskrit books.*** **Natha, P., Chaudhuri, J.B. and Napier, C.F.** **London, 1938-57.** **4 vols.** ***Bibliography of South Asian periodicals: a union-list of periodicals in South Asian languages.*** **Shaw, G.W. and Quraishi, S.** **Brighton, 1982.**
3.	**Bodlean Library**	**Has one of the largest collections of Sanskrit texts outside of India**
4.	**Resources in France**	**The École française d'Extrême-Orient (EFEO) is a French institute dedicated to the study of Asian societies. Translated into English, it approximately means the French School of the Far East. It was founded in 1900 to study the civilization of Saigon (now Ho Chi Minh City) in what was then French Indochina. Its headquarters are now in Paris. Its main fields of research are archaeology and the study of modern Asian societies. The School**

	has a branch in Pondichery. **École française d'Extrême-Orient** **22, avenue du Président Wilson** **75116 PARIS** **tél. 01 53.70.18.60** **fax 01.53.70.87.60** ***They have a website http://www.efeo.fr/contacts/paris.shtml***

| 5. isr tin nn g | **Listing of libraries with South Asian Collections** | ***http://www.columbia.edu/cu/lweb/indiv/southasia/cuvl/LIBS.html***
• **British Library Oriental & India Office Collections**
○ **About** the British Library's Asia, Pacific & Africa collections
○ **About** the India Office Records
○ **Search** the British Library's integrated online catalogue
○ **Search** OIOC's 19th Century Indian holdings (via DSAL)

• **Cambridge University Centre of South Asian Studies**
○ **About** the CSAS library
○ **About** the Cambridge University Library Oriental Collections
○ **Search** the Cambridge University Library online catalog (Newton)

• **Cleveland Public Library**
○ **About** the John G. White Collection of Orientalia (extensive Indic holdings)
○ **Search** the CPL/ClevNet Online Catalog

• **Columbia University**
○ **About** the South Asia collections
○ **Search** CLIO (Columbia's online catalog)
○ **Current Information Sources** (at Lehman Library, Columbia)

• **COPAC**
(a union catalog of British Research Libraries, including Cambridge Univ., Edinburgh Univ., Glasgow Univ., Leeds Univ., and Oxford Univ.)

• **Cornell University**
○ **About** Cornell's South Asia collections
○ **Search** the Cornell University online catalog (full-featured web-catalog)

• **Harvard**
○ **Search** Harvard's HOLLIS (Harvard OnLine Library Information System)

• **Leiden University** (Netherlands)
○ **Search** the Leiden online catalog

• **Library of Congress**, Southern Asia Section
○ **About** the Library of Congress Southern Asia Section |

○ **About** the Library of Congress Asian Reading Room South Asia collection
○ **Search** Library of Congress Online Catalog
○ **LC Field Office New Delhi**

- **National Archives of India**
○ **NAI home page**
○ **User's Guide** to the National Archives of India (Richard White, Univ. of Wales, via H-ASIA)

- **National Library of Australia**
○ **About** Australia's national South Asia Collections
○ **Search** NLA's online catalog

- **National Library of Bhutan**

- **National Library of Scotland**
○ India Papers collection
○ Medical History of British India

- **New York Public Library**
○ **About** NYPL's Oriental Division and its South Asia Collections
○ **Search** NYPL's CATNYP (online catalog)

- **Oxford University**
○ **About** the Indian Institute Library (of the Bodleian Library)
○ **Search** Oxford's OLIS (online catalog)

- **School of Oriental & African Studies - SOAS** (University of London)
○ **About** SOAS' South Asia Collections
○ **Search** SOAS' online catalog (web)
○ **Search** SOAS' online catalog (telnet)
- at the username prompt, type: **library**

-
- **South Asia Resources Database**: The Australian Union Catalogue of South Asian Library Resources (via Curtin University)
(About 250,000 indexed bibliographic records from two files: main file of South Asia holdings in Australian libraries, and MARC records from National Library of Australia which don't have Australian locations. Site includes simple search as well as advanced boolean searching capabilities.)

- **SVK: Sundarayya Vignana Kendram** (Hyderabad, India)
○ **ABOUT** Sundarayya Vignana Kendram and its libraries

- **SEARCH** the catalog of the Urdu Research Library Collection housed at SVK

- **University of British Columbia**
  - **Search** UBC's online catalog (web access)
  - **Search** UBC's online catalog (telnet access)

- **University of California - Berkeley**
  - **About** UC Berkeley's South Asia Collections
  - **Search** UC Berkeley's PATHFINDER (online catalog)

- **University of Chicago**
  - **Homepage** of UC Library's South Asia section
  - **Search** University of Chicago's online catalog

- **University of Groningen** (Netherlands)
  - **Search** the University Library's online catalog

- at the username prompt, type: **OPC**
- to get to English menus, type: **ENG**
- to select the catalogues, type: **X**

- **University of Hawai at Manoa**
  - **About** University of Hawaii's South Asia collections
  - **Search** University of Hawaii's online catalog

- **University of Heidelberg - South Asia Institute Library**
  - **About** the Institute's South Asia Special Subject collections
  - **Search** University of Heidelberg's Library catalogue

- **University of Michigan Libraries**
  - **About** University of Michigan's South Asia collections
  - **Search** University of Michigan's MIRLYN (online catalog)

- **University of Minnesota, Ames Library of South Asia**
  - **About** the Ames Library of South Asia and its collections
  - **Search** University of Minnesota Ames collection (online catalog)

- **University of Pennsylvania**
  - **About** Penn Library's South Asia section and its collections

- **Search** University of Pennsylvania's FRANKLIN (online catalog)

- **University of Texas, Austin**
  - **About** University of Texas Asian Studies collections
  - **Search** University of Texas UTNetCat (online catalog)

- **University of Toronto**
  - **Search** University of Toronto's online catalog (web access)
  - **Search** University of Toronto's online catalog (telnet access)

- at the username prompt, type: **UTLINK**
- then hit the return key twice

- **University of Virginia**
  - **About** University of Virginia's South Asia collections
  - **Search** University of Virginia's online library catalog

- at the login prompt, type: **virgo**
- at the terminal selection menu, choose **22** for vt100

- **University of Washington**
  - **Homepage** of the UW Library's South Asia Section
  - **About** University of Washington's South Asia collections
  - **Search** University of Washington's online catalog

- **University of Wisconsin - Madison**
  - **About** University of Wisconsin's South Asia collections
  - **Search** University of Wisconsin's MadCat (online catalog)

- **The Wellcome Library**, London
  - **About** the library's collections (incl. oriental holdings & special collections)
  - **About** the library's South Asian Iconographic Collections
  - **About** the library's Oriental Manuscripts & Printed Books
  - **Search** the Wellcome Library's online catalog

cademy, New Delhi.

(1324 words)

Appendix G

Tutorial on Indic Cosmology , Indic Calendars and Archaeo Astronomy

Hindu Cosmology & the Celestial Timekeepers

Introduction

In order to understand the Indic approach to history, one must understand the cosmology and the calendar of the Hindu.The calendar and the cosmos have always played a large part in the consciousness or weltanschuung of the Hindu and he spent a large portion of his observational powers in deciphering the universe around him. In this he was not alone, as we know now that other civilizations had similar interests and a curiosity about the heavens. But the answers the Indic came up with were quite prescient for his time and the resulting numbers were far more accurate than the European world realized or knew even millennia after the Indic discovered these periodicities. The extraordinary allergy that the Occidentals, with a few notable exceptions, have exhibited to the study of the Indic mathematical tradition is astonishing to say the least. The resulting illiteracy on the part of the western scholar on matters pertaining to India was lethal to the understanding of their own history and leaves Occidental historians, the task of explaining why there was no progress in Europe between the time of the Greek contribution to the mathematical sciences and the flowering of the renaissance resulting in the Keplerian paradigm shift. We are in the process of chronicling the study of those individuals who in turn studied India or studied subjects in which the Indics had great proficiency, beginning with ancient Babylon to the British

We view the study of history and philosophy of science as central to the understanding of any civlizationand its ethos. And hence we make no apology for the emphasis on science, and especially on Astronomy in this volume

The Ancient Vedics seemed to have an obsession for precision as well as a fascination for large numbers. They also subscribed to the notion that the planet earth and the solar system were of immense antiquity without a beginning, in contrast to the creationist theories propounded by many in the west till recently. A combination such as this makes an excellent prerequisite for time keeping and for devising a useful and practical calendar. So, they turned to the sky and began to decipher the meaning behind the various cycles they observed. Let us see how they went about developing a calendar that would convey a lot of information merely by knowing the day of the month, after constant observation of the sky both during the day and the night over centuries. The result was a highly efficient and accurate calendar. The added bonus of such a system is the usefulness of the recordings of ancient astonomy to decipher the age at which various events took place.

The basic information they used for purposes of time keeping were the motions of the sun and the moon relative to the earth. So far nothing unusual, as did all the other ancients. The cycles they used apart from the day, the week, the fortnight, and the month are shown in Table 1.

Table I

1. 60 year Jovian cycle/ 360 year 'divine cycle

2. 2700 year cycle of the Sapta Rishi or the Ursa Major

3. 26000 year cycle of the asterisms called the Great Year or the precession cycle

4. 432,000 year cycle called a yuga (= duration of Kaliyuga)

5. 4,320,000 year cycle known as the Maha Yuga

6. Kalpa, the cycle consisting of 4.32*109 years**

But first we give a brief history of Indic astronomy, to put the astronomical discoveries in the proper context within the larger canvas of Indic history. Contrary to the conventional wisdom of occidental versions of the Indic narrative, India had a very strong and consistent tradition of scholarship in the so called exact sciences of antiquity (as Neugebauer called them) such as astronomy and mathematics. The list of famous astronomers and mathematicians is staggering in quantity, in the quality of the contributions, as well as the time span over which it occurred. We list in Table 2 significant contributers

Some Definitions

Let us establish the coordinate systems first. Everyday the celestial sphere appears to turn as the earth rotates, causing the daily rising and setting of the sun, stars and other celestial objects. (vide Figure 1)

Table 8

Cosmology and Numerology

A bit of trivia – all of the numbers in Table 7 are divisible by 9 except the 60 year cycle. The number 9 and its multiples have a mystic significance in the Vedic tradition.

One way of visualizing the number 9 is as follows

The universe is constituted of 3 factors – time, space, and causation

The universe is constituted of 3 Gunas (ingredients) – Sattva, rajas, and tamas

The universe is constituted of the three functions – creation, preservation, and destruction

Thus 3 times 3 makes 9

Two times 9 makes 18, the number of chapters in the Bhagavad Gita

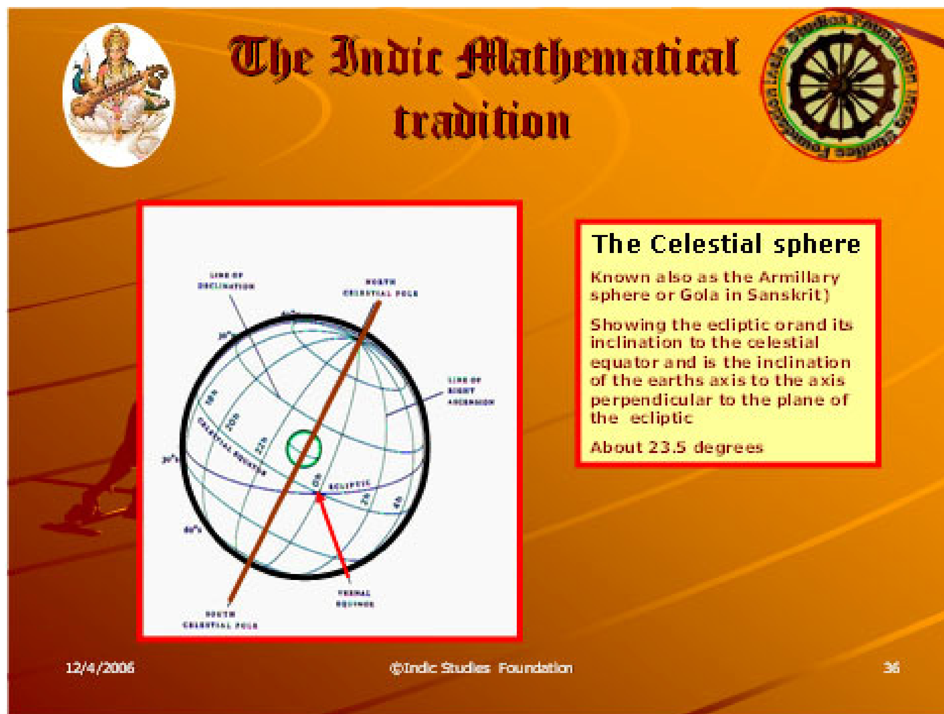
The 18 portions (parvas) of the Mahabharata epic define in detail the career of man on earth.

Thee are 18 days of warfare in the Great Bharata War

There are a total of 18 divisions in the Mahabharata war. 7 divisions on the Pandava side and 11 on the Kaurava side.

The Mahabharata war is thus an exposition of the human possibilities and achievements graded into eighteen categories, the first multiple of 9

Figure 1


The Indic Mathematical tradition
The Celestial sphere
Known also as the Armillary sphere or Gola in Sanskrit)
Showing the ecliptic orand its inclination to the celestial equator and is the inclination of the earths axis to the axis perpendicular to the plane of the ecliptic
About 23.5 degrees
12/4/2006
©Indic Studies Foundation
36

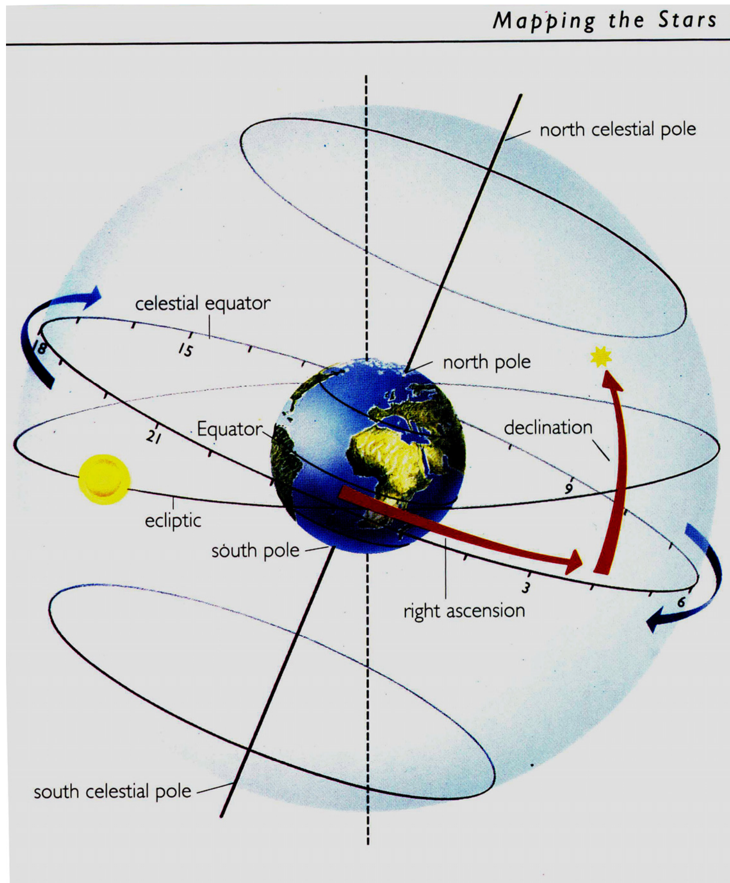


Figure 2 The celestial sphere showing the ecliptic and its inclination to the celestial equator

ecliptic क्त्रांतीव्रुत्त (Kranthivruth)

(ēklĭp´tĭk, ĭ-) , the great circle on the celestial sphere that lies in the plane of the earth's orbit (called the plane of the ecliptic). Because of the earth's yearly revolution around the sun, the sun appears to move in an annual journey through the heavens with the ecliptic as its path. The ecliptic is the principal axis in the ecliptic coordinate system . The two points at which the ecliptic crosses the celestial equator are the equinoxes. The obliquity of the ecliptic is the inclination of the plane of the ecliptic to the plane of the celestial equator, an angle of about 23 1/2 °. The constellations through which the ecliptic passes are the constellations of the zodiac .



Figure 3 The Ptolemaic Armillary sphere,

The Armillary sphere was also the model used by the Indics, even though Aryabhata was aware that the earth was spinning on its axis and that it was a heliocentric system where the earth was merely a planet. Even today, we use a coordinate system that is geocentric while observing the planets and the rest of the solar system, simply because that is the easiest way to study the sky,

equinox वसंत संपत (Vasanth Sampat) Vernal equinox

(ē´kwĭnŏks) , either of two points on the celestial sphere where the ecliptic and the celestial equator intersect. The vernal equinox, also known as "the first point of Aries," is the point at which the sun appears to cross the **celestial equator** from south to north. This occurs about Mar. 21, marking the beginning of spring in the Northern Hemisphere. At th(e autumnal equinox, about Sept. 23, the sun again appears to cross the celestial equator, this time from north to south; this marks the beginning of autumn in the Northern Hemisphere. On the date of either equinox, night and day are of equal length (12 hr each) in all parts of the world; the word equinox is often used to refer to either of these dates. The equinoxes are not fixed points on the celestial sphere but move westward along the ecliptic, passing through all the constellations of the zodiac in 26,000 years. This motion is called the precession of the equinoxes . The vernal equinox is a reference point in the equatorial coordinate system

Equatorial coordinate system

The most commonly used astronomical coordinate system for indicating the positions of stars or other celestial objects on the celestial sphere is the Equatorial coordinate system . The celestial sphere is an imaginary sphere with the observer at its center. It represents the entire sky; all celestial objects other than the earth are imagined as being located on its inside surface. If the earth's axis is extended, the points where it intersects the celestial sphere are called the celestial poles; the north celestial pole is directly above the earth's North Pole, and the south celestial pole directly above the earth's South Pole. The great circle on the celestial sphere halfway between the celestial poles is called the celestial equator; it can be thought of as the earth's equator projected onto the celestial sphere. It divides the celestial sphere into the northern and southern skies. An important reference point on the celestial equator is the vernal equinox , the point at which the sun crosses the celestial equator in March. To designate the position of a star, the astronomer considers an imaginary great circle passing through the celestial poles and through the star in question. This is the star's hour circle , analogous to a meridian of longitude on earth. The astronomer then measures the angle between the vernal equinox and the point where the hour circle intersects the celestial equator. This angle is called the star's right ascension and is measured in hours, minutes, and seconds rather than in the more familiar degrees, minutes, and seconds. (There are 360 degrees or 24 hours in a full circle.) The right ascension is always measured eastward from the vernal equinox. Next the observer measures along the star's hour circle the angle between the celestial equator and the position of the star. This angle is called the declination of the star and is measured in degrees, minutes, and seconds north or south of the celestial equator, analogous to latitude on the earth. Right ascension and declination together determine the location of a star on the celestial sphere. The right ascensions and declinations of many stars are listed in various reference tables published for astronomers and navigators. Because a star's position may change slightly (see proper motion and precession of the equinoxes), such tables must be revised at regular intervals. By definition, the vernal equinox is located at right ascension 0 h and declination 0°.

Another useful reference point is the sigma point, the point where the observer's celestial meridian intersects the celestial equator. The right ascension of the sigma point is equal to the observer's local sidereal time . The angular distance from the sigma point to a star's hour circle is called its hour angle ; it is equal to the star's right ascension minus the local sidereal time. Because the vernal equinox is not always visible in the night sky (especially in the spring), whereas the sigma point is always visible, the hour angle is used in actually locating a body in the sky.

Calendars and Tithis

The Indian calendrical system is based on sidereal measurements. In order to understand the system we need to review some definitions of the year, month and the day.

The Year

A *solar year* and a *sidereal year* both refer to the amount of time it takes Earth to revolve about the Sun. The difference between the two measures is in the reference point for one revolution. The Latin root of *sidereal* is *sidereus,* “starry,” which itself comes from *sides,* “star, instellation.” The Latin root of *solar* is *solis,* “sun.” Thus, the difference between a solar year and a sidereal year is the difference in time between one complete revolution of Earth relative to the Sun, and one complete revolution of earth relative to the constellations respectively.

A **tropical year** (also known as a **solar year**) is the length of time the Sun, as seen from the Earth, takes to return to the same position along the ecliptic (its path among the stars on the celestial sphere) relative to the equinoxes and solstices, or the time interval needed for the mean tropical longitude of the Sun to increase by 2π (360 sexagesimal degrees, a complete turn).

The length of time depends on the starting point on the ecliptic. Starting from the (northern) vernal equinox, one of the four cardinal points along the ecliptic, yields the **vernal equinox year**; averaging over all starting points on the ecliptic yields the **mean**

tropical year.

On the Earth, the tropical year is shorter than a sidereal year. This diference was, in AD 1900, 20.400 min, and in AD 2000, 20.409 minutes, and seems to slow the Sun from

south to north and back. The word "tropical" comes from the Greek *tropos* meaning

"turn". The tropics of Cancer and Capricorn mark the extreme north and south latitudes

where the Sun can appear directly overhead.

The position of the Sun can be measured by the variation from day to day of the length

of the shadow at noon of a gnomon (a vertical pillar or stick). This is the most "natural"way to measure the year in the sense that the variations of insolation drive the seasons.

The **sidereal year** is the time taken for the Sun to return to the same position with respect to the stars of the celestial sphere. It is the orbital period of Earth, equal to365.25636042 mean solar days (31,558,149.540 seconds), that is 366.25636042 earth rotations or sidereal days. (A true cycle will always compare two objects that differ mathematically by exactly 1). The sidereal year is 20 minutes and 24 seconds longer than the tropical year.

The Sun and the stars cannot be seen at the same time; if one looks every dawn at the eastern sky, the last stars seen appearing are not always the same. In a week or two an upward shift can be noted. As an example, in July in the Northern Hemisphere, Orion cannot be seen in the dawn sky, but in August it becomes visible. In a year, all the constellations rotate through the entire sky.

If one looks regularly at the sky before dawn, this motion is much more noticeable and easier to measure than the north/south shift of the sunrise point in the horizon, which defines the tropical year on which the Gregorian calendar is based. This is the reason many cultures started their year on the first day a particular special star, (Sirius, for instance), could be seen in the East at dawn. In Hesiod's Works and Days, the times of the year for sowing, harvest, and so on are given by reference to the first visibility of stars.

Up to the time of Hipparchus, at least in Europe, the years measured by the stars were thought to be exactly as long as the tropical years. Even then , in fact until the16th century they had no accurate sidereal measurements. In fact, sidereal years are very slightly longer than tropical years. The difference is caused by the precession of the equinoxes. One sidereal year is roughly equal to 1 + 1/26000 or 1.000039 tropical years,

But until 1540 CE when the Society of Jesus sent a whole slew of Jesuits trained to absorb such knowledge, in order that they may learn the science of the calendar and of navigation from the Namboodri Brahmanas of Kerala. Prior to this date the Portuguese who were the most advanced in these matters, only sailed during the night, when they had the visible stars to guide them. An average voyage to India took them 2 years from Lisbon. With the knowledge so gained they fixed the Gregorian calendar which was always error prone.

Julian Year - In astronomy, a Julian year (symbol: a) is a unit of measurement of time defined as exactly 365.25 days of 86,400 SI seconds each, totalling 31,557,600 seconds. That is the average length of the year in the Julian calendar used in Western societies in previous centuries, and for which the unit is named. Nevertheless, because a Julian year measures duration rather than designates date, the Julian year does not correspond to years in the Julian calendar or any other calendar. Nor does it correspond to the many other ways of defining a year .

Like most Asian calendars Indian calendars do not employ solely the solar year and day (i. e. tropical year and solar day) but the sidereal year, and the Synodic month(29.5306 days). Thus, the calendric year based on the sidereal year is defined as the time between two successive passes of the sun through a certain star's circle of declination.Lunar days and sidereal months are also used, and in certain lunisolar calendars lunar year and lunar month are taken into account, too.

The Astronomical knowledge of Ancient India was written down in scientific treatises, called Siddhantas. In them, values for the lengths of months and years were given representing the latest knowledge at the time the Siddhanta was written. The values range from 365.258681 days in the Âryabhatiya to 365.258756 days in the Surya Siddhanta and are all too long compared with the modern sidereal year length of 365.25636 days. Nevertheless they are still in use in Indian calendars today.

The Month

Lunar or Synodic Month - The **month** is a unit of time, used with calendars, which is approximately as long as some natural period related to the motion of the Moon. The traditional concept arose with the cycle of moon phases; such months (lunations) are synodic months and last approximately 29.53 days. From excavated tally sticks,researchers have deduced that people counted days in relation to the Moon's phases as early as the Paleolithic age. Synodic months are still the basis of many calendars today.

. This longer period is called the *synodic* month from the Greek *syn hodô* (σὺν ὁδῴ), meaning "with the way [of the sun]". Because of the perturbations of the orbits of the earth and Moon, the actual time between lunations may range from about 29.27 to about 29.83 days. The long-term average duration is 29.530588 days (29 d 12 h 44 min 2.8 s). The synodic month is used in the Metonic cycle.

Sidereal Month - The period of the Moon's orbit as defined with respect to the celestial sphere is known as a *sidereal* month because it is the time it takes the Moon to return to a given position among the stars (Latin: *sidus*): 27.321661 days (27 d 7 h 43 min 11.5 s). This type of month has been observed among cultures in the Middle East, India, and China in the following way: they divided the sky into 27 or 28 lunar mansions, defined by asterisms (apparent groups of stars), one for each day of the sidereal month. The sidereal month is thus, about two day shorter (27.3217) than the Synodic month.

The sidereal month is about two day shorter (27.3217) than the Synodic month

Meaning of Tithi

According to the Indian calendar *or Panchanga, Tithi* is a lunar date based on the rotation of the moon around the earth, and is one of the five important aspects of an Indian almanac (*Panchanga – Panch* means five and *anga* means parts). Most of the Indian social and religious festivals are celebrated on a date corresponding to the original *Tithi*.

The current calendar "date" based on the Gregorian Calendar that we are so familiar with in our daily life is heliocentric and is based on the rotation of the earth around the sun. It takes the earth approximately 365 ¼ days to complete its rotation around the Sun. The calendar that most of us use today divides the 365 days of earth's period of rotation around the Sun in twelve months. The leap year, which occurs once every four years, accounts for ¼ day per year.

Similar to the solar calendar, the lunar calendar is also popular and widely used in the Asian countries such as China, Pacific-rim countries, Middle East countries, and India. The lunar calendar, which is believed to have originated in India, has been around for a very long time, even long before the solar calendar.

The lunar calendar is geocentric and is based on the moon's rotation around the Earth. The lunar month corresponds to one complete rotation of the Moon around the Earth. Since this period of rotation of moon around the earth varies, the duration of lunar month also varies. On average, the lunar month has about 29 ½ days, the period of the lunar Synodic orbit. In addition to moon's rotation around the earth, the lunar year is based on earth's rotation around the Sun. In general, the lunar year has twelve lunar months of approximately 354 days (29.5 *12), thus making it shorter by about 11 days than the solar year. However, the lunar calendar accounts for this difference by adding an extra lunar month about once every 2 ½ years. The extra lunar month is commonly known as "*Adhik Mas*" in India (*Adhik* means extra and the *Mas* means month). The concept of this extra month is similar to the "Blue Moon" in the West, which occurs almost with the same frequency of 2 ½ years.

The Indian lunar year begins on the new moon day that occurs near the beginning of the Spring season. The twelve lunar months are:

Chaitra
Vaishakh
Jeshta
Ashadh
Shrawan(Sawan)
Bhadrapad(Bhado)
Ashwin
Kartik
Margshirsh
Paush
Magha
Falgoon (Fagan)

As mentioned earlier, to account for the difference between the solar and lunar year an extra lunar month occurs about every 2 ½ years as "*Adhik Mas".* **[1]**[1]

According to the Moslem calendar which is widely followed in Middle East and in other Moslem countries the lunar year is strictly based on twelve lunar months of 354 days per year. That's why their holy month of *Ramadan* occurs by approximately 11 to 12 days earlier than that in the preceding year.

The solar day (commonly referred as the "the date" in western calendar) has a fixed length of 24 hours. The change of date occurs at midnight as per local time or standard time of a given local time zone. Thus, the date changes from midnight to midnight. Similarly the day (as in weekdays) changes from midnight to midnight as per local or standard time for that location. In other words, as per the western (or English) calendar the length of day and date is exactly 24 hours, and there is a definite correspondence between the date and the corresponding day of the week.

A lunar day usually begins at sunrise, and the length of lunar day is determined by the time elapsed between the successive sunrises. As per the Jewish calendar their lunar day begins at the sunset, and lasts through the next

sunset. A lunar day is essentially the same as a weekday. In India the lunar day is commonly referred as "*War*". Just as the English calendar has seven days for a week, the Indian calendar has seven *wars* for a week. Thus,

English calendar weekdays	Indian calendar weekdays
Sunday	*Raviwar*
Monday	*Somwar* *(Chandrawar)*
Tuesday	*Mangalwar*
Wednesday	*Budhwar*
Thursday	*Guruwar*
Friday	*Shukrawar*
Saturday	*Shaniwar*

The lunar day, however, varies approximately between 22 to 26 hours based on the angular rotation of moon around the earth in its elliptical orbit. In the Indian calendar, the lunar date is referred as "*Tithi*". The basis for the length of a lunar date is geocentric and is defined as the angular distance between the sun and the moon as seen from the earth. As the moon rotates around the earth, the relative angular distance between the sun and the moon as seen from the earth increases from 0 degrees to 360 degrees. It takes one lunar month or about 29 ½ solar days for the angular distance between the sun and the moon to change from 0 to 360 degrees. When the angular distance reaches zero, the next lunar month begins. Thus, at the new moon a lunar month begins, at full moon, the angular distance between the sun and the moon as seen from the earth becomes exactly 180 degrees.

The lunar cycle begins with crescent moon and the crescent phase lasts till that phase culminates in the full moon, typically lasting for about 15 days. Then the moon enters in the waning phase until it disappears from the sky by lining up with the Sun. The waning phase also lasts for about 15 days. According Indian lunar month, the crescent lunar phase fortnight is called as "*Shudha or Shukla Paksha*" and the waning phase of the lunar cycle fortnight as " *Krishna Paksha*". Thus, during *Shudha (or Shukla) Paksha* the angular distance between the moon and the sun varies from 0 degrees to 180 degrees while that during the *Krishna Paksha* from 180 to 0 degrees. If we divide 180 degrees into 15 equal parts, then each part becomes of 12 degrees in length. Thus, this each twelve-degree portion of angular distance between the moon and the sun as it appears from the earth is the lunar date or *Tithi*. *Tithis* or lunar dates in *Shudha (or Shukla) Paksha* begin with *Prathama* (first), *Dwitiya* (second), etc. till we reach the *Poornima*, the lunar date for full moon day. Similarly for the waning fortnight lunar cycle or *Wadya (or Krushna) Paksha*, *tithis* begin again with *Prathama* (first), *Dwitiya* (second), etc. till we arrive *Amavasya* or a day before the new moon. Thus when we refer to *Ramnavami* (the birthday of *Rama*), it's *the Navami* (ninth lunar day) of *Shudha Paksha* of the lunar month *Chaitra, or Chaitra Shudha Navami*. Similarly, the *Gokulashtmi* (also called *as Janmashtami*, the birthday of *Krishna*) occurs on *Shrawan Wadya Ashtami* (eighth lunar day of *Wadya Paksha* of the lunar month *Shrawan).*

The angular velocity of moon in its elliptical orbit around the earth varies continuously as it is affected (according to Kepler's Law) by the relative distance between the earth and the moon, and also by the earth's relative distance

from the sun. As a result, the daily angular speed (the speed of the angular change between the moon and the sun as seen from the earth) varies somewhere between 10 to 14 degrees per day. Since the length of a *Tithi* corresponds to 12 such degrees, the length of a *Tithi* also varies accordingly. Therefore, a *Tithi* can extend over one day (24 hour period) or it can get sorteneded if two *Tithis* occur in one 24 hour day.

Since the angular distance between the moon and the sun as referred here is always relative to the entire earth, a lunar day or *Tithi* starts the same time everywhere in the world but not necessarily on the same day. Thus, when a certain *Tithi* starts at 10:30 PM in India it also begins in New York at the same time, which is 12 PM (EST) on the same day. Since the length of a *Tithi* can vary between 20 to 28 hours, its correspondence to a *War* (a weekday) becomes little confusing.

As per the Indian calendar, the *Tithi* for a given location on the earth depends on the angular distance between the moon and the sun relative to the earth at the time of sunrise at that location. Thus, for instance, assume on a November Monday sunrise in New York city occurs 8:30 AM (EST). Further assume that at 9 AM (EST) on Monday the angular distance between the sun and moon is exactly 12 degrees just following the new moon of the Indian lunar month *Kartik.* Since the length of a *tithi* is 12 degrees, the *tithi, Kartik Shudha Dwitiya* (second day) begins exactly at 9 AM on Monday of that November in New York. However, at the time of sunrise on that Monday the *tithi Dwitiya* has not begun. Therefore, the *tithi* for that Monday for city of New York is *Kartik Shudha Prathama* (first day).

On the same Monday morning the sunrise in Los Angeles occurs well past 9 AM (EST). Since the *Tithi Dwitiya* occurs everywhere in the world at the same instant, therefore, for Los Angeles, the *Tithi* for that Monday would be *Karthik Shudha Dwitiya.*

For the same Monday at 9 AM (EST), it would be 7:30 PM in Mumbai or New Delhi. Thus, *Tithi* for that Monday for city of New York, Mumbai, and New Delhi is *Karthik Shudha Prathama* (the first day of Indian lunar month *Karthik*) while for most of the regions west of Chicago or St. Louis the *Tithi* for that Monday is *Dwitiya*. In other words, the *Tithi Karthik Shudha Prathama* for regions west of Chicago or St. Louis should occur on the preceding day, the Sunday.

Karthik Shudha Prathama (the first day of Indian lunar month *Karthik*) also happens to be the first day after *Diwali*. Most of the Indians celebrate this as their New Year 's Day. Indians living in India, Europe, and eastern part of the United States thus should celebrate their New Year on that Monday while regions west of Chicago should celebrate on the preceding day, the Sunday. (Based on description by Jagdish C. Maheshri) October 12, 2000

The basis of the Hindu calendar calculation is Vedic[2]. This calendar has been modified and elaborated, but because it is based on the stars (Nakshatras) visible to the naked eye, and on the visible Lunar phases, it is more accurate than any others of the past. The actual moments when Lunar months begin can easily be checked by the regular appearances of Solar eclipses, and the middle moment of a Lunar month -- Poornima or full moon -- can similarly be verified by the more frequent Lunar eclipses. Hence the Hindu calendar, not requiring special instruments for its rectification, has maintained great accuracy for thousands of years.

The oldest calendar is probably the Vedic calendar among the languages referred to as IE languages; at first lunar, later with solar elements added to it. The sister Avesta calendar is similarly first Lunar, but later only Solar. Both these calendars (the oldest in the IE universe) are influenced by the prehistoric calendars of the first and second root races at the North Pole and its surroundings, as they reckon with days and nights lasting six months.

[1] *Adhik Mas* occurs only when two *amavasyas* (no

Table 9

Sl.No	Krsna **paksa** (dark fortnight) Waning moon	Gaura or shukla paksa (bright fortnight) Lightening moon	Deity and properties
1	Pratipat	Pratipat	The presiding deity of the first lunar day in Brahma and is good for all types of auspicious and religious ceremonies
2	Dvitiya	Dvitiya	Vidhatr rules this lunar day and is good for the laying of foundations for buildings and other things of a permanent nature.
3	Trtiya	Trtiya	Visnu is the lord of this day and is good for the cuttings of one's hair and nails and shaving.
4	Caturthi	Caturthi	Yama is lord of the 4th lunar day, which is good for the destruction of one's enemies, the removal of obstacles, and acts of combat.

5	Pancami	Pancami	The Moon rules this day, which is favourable for administering medicine, the purging of poisons, and surgery.
6	Sasti	Sasti	Karttikeya presides over this day and is favourable for coronations, meeting new friends, festivities, and enjoyment.
7	Saptami	Saptami	The 7th lunar day is ruled by Indra; one may begin a journey, buy conveyances, and deal with other such things as a movable nature.
8	Astami	Astami	The Vasus rule this day, which is good for taking up arms, building of one's defenses, and fortification.
9	Navami	Navami	The Serpent rules this day, with is suitable for killing enemies, acts of destruction, and violence.
10	Dasami	Dasami	The day is ruled by Dharma and is auspicious for acts of virtue, religious functions, spiritual practices, and other pious activities.
11	**Ekadasi**	**Ekadasi**	Rudra rules this day; fasting, devotional activities, and remembrance of the Supreme Lord are very favourable.
12	Dvadasi	Dvadasi	The Sun rules this day, which is auspicious for religious ceremonies the lighting of the sacred fire, and the performance of one's duties.
13	Trayodasi	Trayodasi	The day is ruled by Cupid and is good for forming friendships, sensual pleasures, and festivities.
14	Caturdasi	Caturdasi	Kali rules this day suitable for administering poison and calling of elementals and spirits.
15	Amavasya (**new moon**)	Purnima (**full moon**)	The Vasve-devas rule the New Moon suitable for the propitiation of the Manes and performance of austerities.

The Clock, the Sidereal Zodiac, Nakshatras, and the Precession of the Equinoxes

For untold ages or yugas, the Hindus have observed the motion of the moon, the sun and the seven planets along a definite path that circles our sky and is marked by fixed clusters of stars. The moon afforded the simplest example. These early astronomers observed that the moon, moving among these fixed star constellations which they called Nakshatras, returned to the same Nakshatra in 27.32166 days, the exact quantity determined by Aryabhatta, thus completing one Nakshatra month. They found it convenient to divide these groups of stars into 27 almost equal sections, or the 27 Nakshatras. By this method of reckoning, instead of giving the date of a month, as Western calendars do, the Hindus gave the name of the Nakshatra in which the moon was to be seen. (The moon is in each of these Nakshatras for approximately one day plus eighteen minutes.)

This scheme fitted nicely with the sun's cycle, for the Hindus noted that the sun traversed the same circle through the sky, but that it returned to its starting place only after 365.258756481 days, or what we call a Solar Sidereal Year. (Modern figures based on this Hindu figure quote 365.2596296 days -- a distinction without a difference, for ordinary purposes.) Now, having already divided the month into the 27 Nakshatras for the convenience of reckoning the moon's voyage through the heavens, what more natural than that these same Nakshatras should serve for the study of the Sun's course? Being in a circle of 360 degrees, each Nakshatra takes up 13 1/3 degrees of that circle. The Sun, moving about 1 degree in a day, is seen for 13 1/3 days in each Nakshatra. The system of reckoning according to the moon Nakshatras is current today that of the sun's being uncommon.

During the course of one day, the earth has moved a short distance along its orbit around the sun, and so must rotate a small extra angular distance before the sun reaches its highest point. The stars, however, are so far away that the earth's movement along its orbit makes a generally negligible difference to their apparent direction (see, however parallax), and so they return to their highest point in slightly less than 24 hours. A mean sidereal day is about 23h 56m in length. Due to variations in the rotation rate of the Earth, however, the rate of an ideal sidereal clock deviates from any simple multiple of a civil clock. The actual period of the Moon's orbit as measured in a fixed frame of reference is known as a Sidereal month, because it is the time it takes the Moon to return to the same position on the celestial sphere among the fixed stars (Latin: sidus): 27.321 661 days (27 d 7 h 43 min 11.5 s) or about 27 ⅓ days. This type of month has appeared among cultures in the Middle East, India, and China in the following way: they divided the sky in 27 or 28 lunar mansions or Nakshatras, characterized by asterisms (apparent groups of stars), one for each day that the Moon follows its track among the stars.

In brief, then, the earliest method, the Vedic, of counting, was to name the moon through the various Nakshatras -- the circle or cycle repeating itself each Sidereal-Star-Month. Later the sun's place in the same Nakshatras was noted, the year ending when the Sun returned to the same Nakshatra. Then came the noting of the Solar and Lunar eclipses, and the observance of the New and Full Moons divided the month into the two phases of waxing and waning Moon, the month beginning at the moment of New Moon. This is how the Hindus reckon today, the month taking its name from the Nakshatra in which the Full Moon is seen each month. The Full Moon being exactly opposite the Sun, the Solar nakshatra bears the same name as the Lunar month six months ahead, while each Lunar month bears the same name as the 14th Solar Nakshatra ahead.

The Western student faced with these unfamiliar calculations may echo the old Persian proverb, "Why count big numbers and small fractions, when they are all amassed in 1?" But the Hindu looks on these figures from another point of view -- he lives with them, and among them, and by them, much of the time. Consider a Sanskrit sloka (verse) about the Savati or pearl nakshatra, which marks the new season after the monsoon is over. The sloka says, "If in the Swati a rain drop falls into the sea, that drop becomes a pearl." This may sound foolish, for the peasant, though he live in the depth of the interior of India, knows that pearls come from the sea -- even if he does not

necessarily understand that these pearls grow inside the oyster. He does know, however, that if it rains at this period of the year, his crops will yield great wealth. And the pearl is synonymous with wealth among people who, if they have any money, invest it in jewelry, especially gold and pearls, rather than in the banks. (Poetically, rice, their staple food).

To summarize, the earth revolves around the Sun once in 365 days 5 hours 48 minutes and 46 seconds. Considered from the earth, the Sun appears to complete one round of the ecliptic during this period. This is the Tropical year. In the span of a tropical year, the earth regains its original angular position with the Sun. It is also called the Year of seasons since the occurrence, and timing, of seasons depends on the rotation of the earth around the sun. If, for example, we consider the revolution of the Sun around the earth from one vernal equinox (around 21st March, when the day and night all over the globe are equal) to the next vernal equinox, it takes one tropical year to do so.

However, if at the end of a tropical year from one vernal equinox to the next, we consider the position of the earth with reference to a fixed star of the zodiac, the earth appears to lie some 50.26 seconds of celestial longitude to the west of its original position. In order for the earth to attain the same position with respect to a fixed star after one revolution, it takes a time span of 365 days 6 hours 9 minutes and some 9.5 seconds. This duration of time is called a sidereal year .The sidereal year is just over 20 minutes longer than the tropical year; this time difference is equivalent to 50.26 seconds of celestial longitude.

Each year, the Vernal equinox will fall short by 50.26 seconds along the zodiac reckoned along the fixed stars. This continuous receding of the Vernal equinox along the zodiac is termed the Precession of the Equinoxes and it takes about 25776 years to make one complete revolution of the precessional motion of the earth's axis. Hipparchus regarded as the discoverer of the precession of the equinoxes in the west gave us either 28,000 or 28,173 years for one revolution.. Another figure given is 25,920 years for the precession cycle, These figures indicate that the mean value of 27,000 years given in the Vedic scriptures is reasonable. The precession of the equinoxes has proved to be very useful for dating certain events in Vedic and Post Vedic times.

There are only a few methods, by which we can determine the age of an event in the absence of radiocarbon dating which is not as precise as the astronomical clocks,

Use the Precession of the equinoxes to determine the Nakshatra in which the Vernal equinox occurs in a particular Nakshatra. If, we recall there are 27 Nakshatras, it follows that the vernal equinox occurs in a different Nakshatra, once every 1000 years.

Use the statements made in the texts to check for internal consistency. If for example Aryabhatta uses a place value system, the zero must have been in fairly wide use by then. If further he uses classical sanskrit (codified by Panini then he must have lived after Panini.

Table 10 Ecliptic, Tropical Zodiac and the Sidereal Zodiac

9 degrees to either side of the Ecliptic is a belt of the Heavens known as the Zodiac. (Dante called it the Oblique Line that beareth all planets).The first 30 degrees of the Zodiac constitute the sign of Aries.,the next 30 degrees Taurus and so on. The Zodiac counted from the first degree of Aries to the 360th degree of Pisces is called the Tropical Zodiac. These 12 signs are the limbs of the Cosmic Man or Time Eternal (Kalapurusha - The Almighty Self as Time). Aries is His head, Taurus His face, Gemini His neck, Cancer His heart, Leo the place beneath, Virgo His belly, Libra His generative organs, Scorpio the place beneath, Sagittarius His upper thigh, Capricorn his lower thigh, Aquarius His leg and Pisces His feet!

Table 10 The Nakshatras

	Western Zodiac name	Indian Nakshatras (Sidereal Zodiac)	Diety	Sector in deg.min deg.min
1.	Beta Arietis	Aswini (Asvayiau)	Asvinau	00 00 13 20
2.	41 Arietis	ApaBharani	Yama	13 20 26 40
3.	Eta Tauri	Karthika	Agni	26 40 40 00
4.	Alpha Tauri	Rohini	Prajapati	40 00 53 20
5.	Lamda Orionis	Mrigasira	Soma	53 20 66 40
6.	Alpha Orionis	Aridra	Rudra	66 40 80 00
7.	Beta Geminorum	Punarvasu	Aditi	80 00 93 20
8.	Delta Cancri	Pushya	Brihaspati	93 20 106 40
9.	Alpha Cancri	Aslesha	Sarpah	106 40 120 00
10.	Alpha Leonis	Magha	Pitarah	120 00 133 20
11.	Delta Leonis	Purva Phalguni	Aryaman (Bhaga)	133 20 146 40
12.	Beta Leonis	Uttara	Bhaga (Aryaman)	146 40 160 00
13.	Gamma Virginis	Hasta	Savitar	160 00 173 20
14.	Alpha Virginis(spica)	Chitra	Indra (Tvastr)	173 20 186 40
15.	PI Hydrae	Svati	Vayu	186 40 200 00
16.	Beta Librae	Vishaka	Indragni	200 00 213 20
17.	Delta Scorpi	Anuradha	Mitra	213 20 226 40
18.	Alpha Scorpi	Jyeshta	Indra (Varuna)	226 40 240 00
19.	Lamda Scorpi	Moola	Pitarah	240 00 253 20
20.	Delta Sagittari	Poorvashad	Aapah	253 20 266 40
21.	Delta Sagittari	Uthrashad	Visvedevah	266 40 280 00
22.	Beta Capricornus	Sravana	Visnu	280 00 293 20
23.	Alpha DelphiniDelta capricornus	Dhanishta (Sravistha)	Vasavah	293 20 306 40
24.	Lamda Aquar	Satabhishaj	Varuna	306 40 320 00
25.	Alpha Pegasi	Poorvabhadra (prosthapada)	Aja Ekapad	320 00 333 20
26.	Alpha Andromeda	Uttrarabhadra (Uttara	Ahirbudhya	333 20 346 40
27.	Zeta Piscium	Revathi	Pusan	346 40 360 00

Each Nakshatra is associated with a deity, and that the deities associated with tha Nakshatra are mentioned in the Riv Veda Samhita is due to the research of Narahari Achar[130].

The antiquity of the naksatra system becomes clear when it is recognized

that all the deity names occur in RV 5.51 (this insight is due to Narahari

Achar21). This hymn by Svasty¯atreya ¯ Atreya lists the deity names as:

A´svin, Bhaga, Aditi, P¯usan, V¯ayu, Soma, Brhaspati, SARVAGAN.

AH.Vi´sve Devah. Agni, Rudra, Mitra, Varun.a, Indr¯agni. The sarvaganah are the ganah.

(groups) such as the Vasavah. Pitarah.Sarpah.ncluding Ahi and Aja), ¯ Apah.

, and the ¯ Adityaganah Daks.a Praj¯apati,Aryaman, Vis.u, Yama, Indra) complete the list. There is no doubt that the ecliptic is meant because the last verse of the hymn refers explicitly to the

fidelity with which the sun and the moon move on their path, the ecliptic.

The division of the circle into 360 parts or 720 parts was also viewed from the point of view the naks.atras by assigning 27 upanaks.atras to each naks.atra (´ Satapatha Br. 10.5.4.5). This constituted an excellent approximation because 27 × 27 = 729. In other words, imagining each naks.atra to be further divided into 27 equal parts made it possible to conceptualize half a

degree when examining the sky.

Values for the Lunar sidereal orbit and the Lunar Synodic orbit are given in Table 11 below

[130] Achar, Narahari "In seach of Contemporary views on Indian civilization" , Proceedings of the Waves conference held in Hoboken, NJ, 2000, edited by Bhudev Sharma

Table 11 Comparison of Aryabhata' s values with modern values

COMPARISONS	Lunar sidereal orbit	Lunar synodic orbit
AD 2000.0	27.32166156	29.53058888
AD 498	27.3216638	29.530591
Àryabhata	27.321668	29.530582
Paulisa Siddhanta	27.321673	29.530587
1604 BC	27.321668	29.530595

Table 12 Comparisons of Aryabhata's values with surya siddhanta

ASTRONOMIC AUTHORITY	Àryabhata (from Clarke and Kay)	Surya Siddanta
Years in Cycle	4,320,000	4,320,000
Rotations	1,582,237,500	1,582,237,828
Days	1,577,917,500	1,577,917,828
Lunar Orbits	57,753,336	57,753,336
Kay notes 57,753,339 lunar orbits rather than 57,753,336 per Clarke.		
Synodic Months	53,433,336	53,433,336
Mercury	17,937,920	17,937,060
Venus	7,022,388	7,022,376
Mars	2,296,824	2,296,832
Jupiter	364,224	364,220
Saturn	146,564	146,568

How old is the universe, Kalachakra and the Yuga concept, Hindu cosmological time frames

The Hindu Calendar or more appropriately Almanac(also known as the Panchanga) currently in practice reckons time in terms of very large cycles called Kalpa (4.32 billion years) consisting of 14 Manvantaras(Manvantara or age of Manu,~ 308 million years). A Manvantara is made up of Mahayugas (Mahayuga= great yuga consists of 4 yugas: Krita, Treta, Dwapara and Kali). Kali yuga is equivalent to 432,000 years and 1 Mahayuga= 4.32 million years. This system appears to have been in use since the days of the Epics and Puranas, and attested in the Siddhantas. However, the earliest Vedic Calendar was based on a cycle also called yuga, but consisting of only five years. This ancient Vedic Calendar was a Luni-solar calendar and used two intercalary months in a five year period and has often been criticized as being very crude.

First we have Kalpa, a day in Brahma's 'life' or 4320 million earthly years, and a night of equal length. During the day he creates and during the night he absorbs to begin the cycle each Brahma day . Each kalpa is divided into 14 Manvantaras or 308.448 million years we are supposed to be in the seventh Manvantara of Vaivasvata Manu. Each Manvantara contains 71 Mahayugas, plus 1 Krtayuga ,and each Mahayuga is divided into 4 yugas — Krta, Treta, Dvapara and Kali of 4800, 3600, 2400 and 1200 divine years of the Gods, each of which = 360 human years. We are at present in the Kali yuga which began in 3102 BCE the traditional year of the Mahabharata war .

Table 13 Yugas and Kalpas

Thus, we have a day in Brahma's life of 1 Kalpa

1 Brahma Day (day and night) = 2 Kalpa

1 Kalpa = 4,320,000,000 earthly years (Y) =14 Manus + 1Kritayuga = 1000 MY =14*71.4+.4 Mahayugas

Kaliyuga = 432,000 Y = 1KY = 1200 divine years (DY) = 1 Yuga

1 DY = 360 Y

Dwapara = 864,000 Y = 2KY = 2400 DY

TretaYuga = 1,296,000 Y = 3KY = 3600 DY

Kritayuga = 1,728,000 Y =4 KY = 4800 DY = 0.4 MY =.4/71.4 = 5.6022408964e-3

Mahayuga (MY) = 4,320,000 earthly years = 10 KY = 12000 DY

1Manvantra (M) = 71 MY = 306.72 million years

1 Manu = 1M + 1 KritaYuga = 308.448 million years = 856,800 DY

1 Kalpa = 14 Manus + 1KritaYuga = 14*71.4 +.4 = 1000 MY = 12,000,000 DY = 4.32 billio

Y = solar or tropical year

DY = 360 Y = divine year

KY = 432,000 = Kaliyuga

MY = 10 KY = Mahayuga = 4,320,000 Y

So how old is the Universe

As of Vaisakhapratipada of 2008 CE, May 1 we are in the second quarter of Brahma's day द्वितिय परार्ध, called Shweta Varaha Kalpa, seventh Manvantara named Vaivasvata and entered into the first quarter of the 28th Kaliyuga. Already 5109 years of this 28th KY have passed. so the time elapsed in this Kalpa is

6 Manus =1,850,688,000 Y = [6*(306,420,000+1,728,000)] = 6 Manus

(includes 6 Jala pralayas or sandhis, periods between Manavantras)

And 27 MY = 116,640,000 Y (27 * 4,320,000)
=27/71.4M = 0.3781512605 M

Add 1 Jala Pralaya(depending on origin of cycle) = 1,728,000 Y

And 28th (Krita+Treta +Dwapara) = 3,888,000 Y (9*432,000) =0.9 MY =.9/71.4

= 0.012605042M

5109 Y of Kaliyuga) = 5109 Y = 5109/4,320,000 MY = 0.0011826388889 MY

So the current year 2006 CE = 1 ,972,949,109 Y or

= 426+27+(.4*7) + .9 +.0011826388889

= 456.701188889 MY

To put this in perspective, if we look at a galaxy 2 billion light years away (a unit of distance)

we would be looking at an obect in time contemporaneous with the age of 1 Brahma day, or the birthday of our solar system

The 12 signs of the Zodiac with Sanskrit names are mentioned In Brihat Samhita and Laghu Bhaskariyam. The former is the work of Varahamihira 505 CE. He is supposed to have borrowed it from a Greek of the 4th century BCE (Could it be Hipparchus). The whole theory of India borrowing from the Greeks needs to be reexamined in greater detail, since it is now clear that the methods used by the Indics were quite unique and distinct from those used by the Greeks. The indic tradition moreover is a living tradition which is practiced by Jyotish even today.

Quote from Koenraad Elst "To conclude this brief acquaintance with Vedic astronomy, we want to draw attention to the possible presence in the Rg-Veda of a momentous cultural artifact, the origin of which is usually situated in Babylonia in about 600 BC: the twelve-sign Zodiac. In RV 1:164:11, the sun wheel in heaven is said to have 12 spokes, and to be subdivided into 360 pairs of "sons": the days (consisting of day and night), rounded off to an arithmetically manageable number, also the basis of the "Babylonian" division of the circle in 3600. The division in 12 already suggests the Zodiac, and we also find, in the footsteps of N.R. Waradpande, that a number of the Zodiacal constellations/ rAshis (classically conceived as combinations of 2 or 3

successive Lunar mansions or Nakshatras of 13 ˚ and 20’ each) are mentioned. Obviously the Rg should be dated prior to the beginning of Kaliyuga, as we have already demonstrated and hence the Babylonian origin of the twelve sign Zodiac is suspect.”

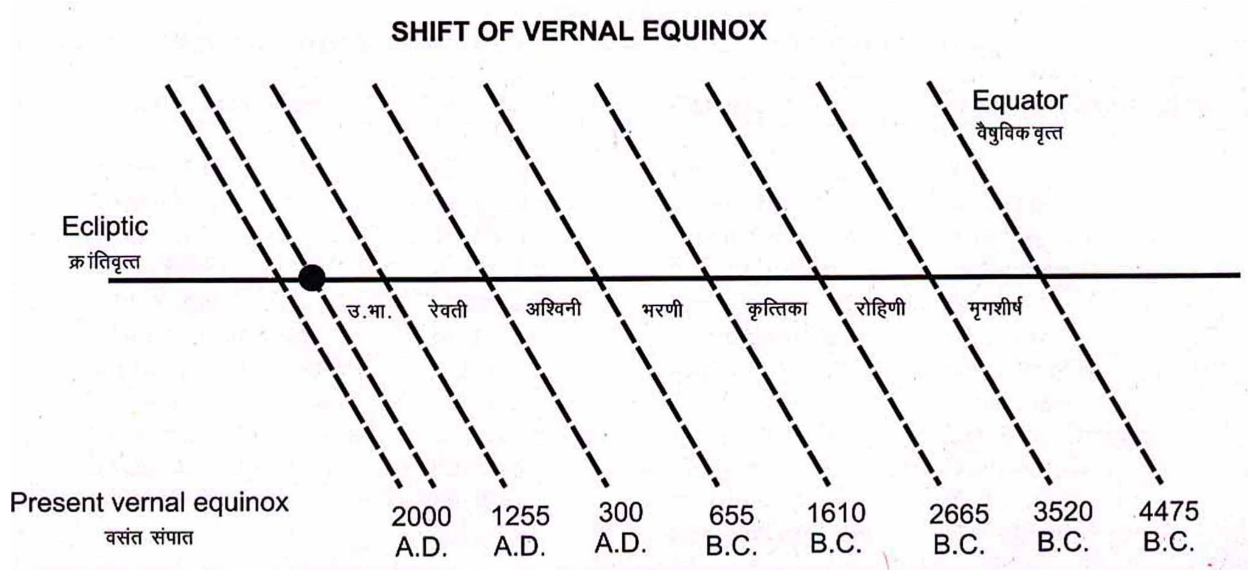


Figure 4 The shift of the vernal equinox through different Nakshatras over 6 millennia

Thus we have the following

The Zodiac is also tenanted by 27 constellations each of them spread over an arc of 13 degrees 20 minutes. The Zodiac counted from the first degree of Beta Arietis (Aswini) to the 360th degree of Zeta Piscium (Revathi) is known as the Sidereal[3] Zodiac.

[2] The following is based on an original account by Dr. Dwarakanath a physicist. He teaches sanskrit during his free time and is interested in vedic learning and vedanta.

[3] Sidereal month the actual period of the Moon's orbit as measured in a fixed frame of reference is known as a *sidereal* month, because it is the time it takes the Moon to return to the same position on the celestial sphere among the fixed stars (Latin: *sidus*): 27.321 661 days (27 d 7 h 43 min 11.5 s) or about 27 ⅓ days. This type of month has appeared among cultures in the Middle East, India, and China in the following way: they divided the sky in 27 or 28 lunar mansions, characterized by asterisms (apparent groups of stars), one for each day that the Moon follows its track among the stars.

Appendix H Glossary

A

Abda - Year (as in Yugabda 5109 (2007))

Abhijit, अभिजित - Abhijit Nakshatra: Abhijit Nakshatra is called the intercalary(IC) Nakshatra as it appear as a small (smaller duration as compared to normal duration of Nakshatra 13d 20m) Nakshatra between Uttarashadha and Sravana. The duration of Uttarashadha is divided into four parts and the first three paadas are assigned to Uttarashadha, which makes the duration of Uttarashadha to be 10deg with each paada to be 2d 30m. The remaining one paada of Uttarashadha is assigned to Abhijit, the intercalary Nakshatra. Similarly beginning 1/15th part of Sravana is given to Abhijit, making its total length to be 253.33 min, i.e., 4d 13m 20s. The remaining 14/15th part of Sravana is assigned to the four padas of Sravana, making the total duration of Sravana to be 12d 26m 40s

Acharya, आचार्य - a spiritual guide or teacher. See Sankaracharya

Adharma, अधर्म - absence of righteousness, disorder, evil, immorality

Adhikamaasa or intercalary month - Leap month or intercalary month introduced to account for the lack of synchronization between a lunar period and a solar period, i.e., the solar period (or year) is not an exact multiple of a lunar month. Literally means additional month. An intercalation takes place when 2 lunar months begin in the same solar month, ,the former of the 2 is called the intercalary month or adhikamaasa

Adi,आदि - first, primordial as in Adi Sankara

Aditi, आदिति - In Hinduism, Aditi (Sanskrit - limitless) is a goddess of the sky, consciousness, the past, the future and fertility. She is an ancient goddess, mother of Agni and the Adityas with Kashyapa. She is associated with cows, a very holy animal in Hindu beliefs. Aditi is the daughter of Daksha and Veerni. She gave birth to the Devas who were beautiful, intelligent and pious to the Almighty. Although the goddess Aditi is mentioned nearly eighty times in the rg-veda, it is difficult to get a clear picture of her nature. she is usually mentioned along with other gods and goddesses, there is no one hymn addressed exclusively to her, and unlike many other vedic deities, she is not obviously related to some natural phenomenon. compared to Usha and Prithvi, her character seems ill defined. she is virtually featureless physically. perhaps the most outstanding attribute of Aditi is her motherhood. She is preeminently the mother of the Adityas, a group of 7 or 8 gods which include Mitra, Aryaman, Bhaga, Varuna, Daksha and Ansa. (2.27.1) Aditi is also said to be the mother of the great god Indra, the mother of kings (2.27), and the mother of gods (1.113.19). Unlike Prithvi, however, whose motherhood is also central to her nature, Aditi does not have a male consort in the Rg-veda. as a mothering presence, Aditi is often asked to guard the one who petitions her (1.106.7 ; 8.18.6) or to provide him or her with wealth, safety, and abundance (10.100; 1.94.15).

Aditya, आदित्य - In Hinduism, the Adityas are a group of solar deities, sons of Aditi and Kashyapa. In the Rigveda, they are seven deities of the heavens, chief of these being Varuna, followed by Mitra, Aryaman, Bhaga, Daksha, and Ansa, the seventh Aditya was probably the Sun, Surya or Savitar. As a class of gods, the Rigvedic Adityas were distinct from the Visvedevas. In the Yajurveda (Taittiriya Samhita), their number is given as eight. In the Brahmanas, their number is expanded to twelve, corresponding to the twelve months:Ansa ,Aryaman, Bhaga ,Daksha ,Dhatri, Indra, Mitra, Ravi, Savitar, Surya , Varuna, Yama Aditya in the (Chāndogya-Upanishad) is also a name of Vishnu, in his Vamana (dwarf) Avatar. Dictionary of Hindu Lore and Legend (ISBN 0500510881) by Anna Dhallapiccola

adhyasa, अद्यासा - used to refer to the 'mistake' that we make when we 'superimpose' a false appearance upon the reality or mix up the real and the unreal.

Adrishta - opposite of drishta or Unseen,a metaphor for the consequences of past actions,which may be unanticipated

advaita,अद्वैत - not two (dvaita)

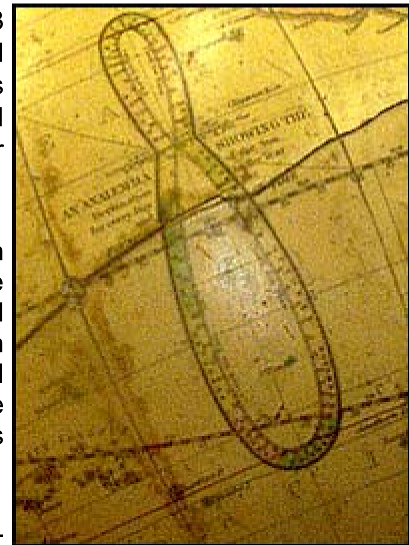
Agama,आगाम - Ancient Sanskrit religious text

Ahimsa,अहिम्स - abstention from injury to all life forms

amAvasya, अमावस्य़ - new moon

analemma

At noon in a perfect world, the sun would always be positioned 93 million miles directly over the equator, and the Earth, an unblemished sphere, would rotate evenly on a precisely vertical axis. The seasons would never change. Every day would last as long as every other. And we'd never have the equinoxes and solstices that mark the four quarters of the year.



Detail of an analemma, on a globe by Gilman Joslin, Boston, 1890, in the collection of the Library of Congress. (By Lawrence W. Jackson Jr./wp.com)

As it happens, however, the Earth's axis is tilted and, according to Ruth Freitag, a senior science specialist at the Library of Congress, the "slightly eccentric ellipse" of the Earth's orbit around the sun led astronomers to come up with a consistent way to determine mean time, the time by which we all set our clocks. "The natural system is full of variables, and that's without even considering the irregularities of the Earth's rotation, which came to light in the late 19th century," says Freitag.

Thus we have the analemma, the somewhat mysterious looking figure-eight diagram on many globes and maps. The analemma charts where and when the sun will appear directly overhead in the "torrid zone," between the Tropic of Cancer and the Tropic of Capricorn. The curves of the analemma also mark the solstices and equinoxes. The winter solstice, occurring when the sun is at its southernmost position in the torrid zone, is shown on the most extreme point of an analemma's lower arc.



"In the days before the radio, the analemma was also useful for correcting clocks," says author David Greenhood in his book "Mapping."

The days may be dark now but the horizon looks bright: Since the winter solstice marks the shortest day and the longest night of the year, the days will begin to stretch out from now until the summer solstice. Come February and March, when cold temperatures have you fearing that winter will never end, at least the sun will hang a little longer in the evening sky.

"Winter," depicted on an atlas by Joan Blaeu, Amsterdam, 1662-1665, in the collection of the Library of Congress. (By Lawrence W. Jackson Jr./wp.com)



AnumAna, अनुमान - anumaana or inference is one of the most importrant contributions of the system of metaknowledge known as Nyaya (which translates as Logic)

Anushtup chandas - A meter in prosody with 32 syllables

Aparapaska - full moon to new moon period

Apastambha अपस्तम्भ - Apastambha was an ancient Vedic savant ,who composed the Sulvasutra named after him, credited with approximation for square root of two. His goal was among others to design ritual altars and to conform to the rules of Vastu Sastra,circa 2500 BCE. Apastambha predates Aryabhatta since Aryabhatta refers to the Sulvasutras in his magnum opus Aryabhattium

Artha, अथ्र - Object, purpose, aim, significance, import. Attainment of worldly riches, prosperity, wealth, one of the goals of life prescribed by the Vedics in the Brahma Vidya

Aranyakas, आरण्यक - The third part of each of the Vedas (after Samhitas, and Brahmanas) elaborating various spiritualistic practices for forest dwelling initiates into spirituality. The Aranyakas (Sanskrit *āraṇyaka*) are part of the Hindu śruti; these religious scriptures are sometimes argued to be part of either the Brahmanas or Upanishads. The name translates to "the forest books", meaning, treatises for hermits or sadhus living in the wilderness. This contrasts with the grhyasutras, treatises intended for domestic life. Their language is early Classical Sanskrit, and together with the bulk of the Upanishads, the Aranyakas form the basis of Vedanta,

Arati - A ritual in which a plate or thali with a deepa(oil lamp) and other items of ritual purification such ahs flowers, incense,kumkum and turmeric, are waved at lelast 3 times clockwise around a venerated person or object. Sometimes the plate may contain just water with kumkum dissolved in it .

Arjava, आर्जव - straightforwardness at all times

Arjuna - The third of the five pandava princes, whose expertise lies in Archery . He is the protagonist in the Bhagvad Gita, the disciple of his friend and mentor Sri Krishna, the avatar of the Lord Himself

Aryabhatta, आर्यभठ - ancient Indian mathematician the astronomer laureate of India , who lived in the Post Vedic period. His dating is controversial but could be as early as 2500 BCE and if so is contemporaneous or even predates Babylonian mathematicians, see Aryabhata I

Arya,आर्य - is an adjective, meaning noble such as in Arya Putr, noble son or noble prince

Aryan, आर्यन - A term connoting the fictitious Aryan race, see also Vedics, should not be used synonymously with Aryan which has a racial connotation. Arya is purely a behavioral adjective and nothing more.

Aryan Race - A fictitious classification without any scientific basis used by the Europeans to distinguish themselves from the Semitic speaking people of the world. A word that has been foisted upon the Vedics who used the adjective Arya meaning of noble behavior. there was no racial connotation as there is now in Europe

Ashvamedha - A part of Rajasuya ritual performed by emperors to establish their sway over allies and neighboring kingdoms.

Asuras, असुर - Demons of the Vedic Hindus, linguistically cognate with Ahura (e.g. Ahura Mazda) in Zoroastrianism. Thus, while in Vedic religion the A*s*uras are demonic, in Zoroastrianism, the A*h*ura are benign. This inversion also applies to the other class of immortals: where the Vedic *devas* are benevolent, the Zoroastrian *daeva*s are

malevolent. It is believed that this resulted in the Great schism between the Vedic Hindus and the followers of Zoroaster(**Dhrutarashtra**) who migrated west into what is Iran today.

Avidya, अविद्य - The state of ignorance which needs to be dispelled at the outset, before one can begin the journey in earnest towards self fulfillment and Moksha. 'Ignorance is bliss ' or so the satire goes. Ignorance most certainly is not bliss. It is one of the greatest sins a Hindu can commit. Avidya (pAra or apAra) is an unpardonable excuse and as soon as a person determines he/she is in a state of Avidya, they should take steps to remedy the situation.

Ayana - Course or journey; refers to the apparent direction of the suns course through the sky, uttarayana (north), dakshinaayana (south); cited in Sankalpam. Going, walking; road, path, way. Used in astronomy for advancing, precession; the sun's progress northward or southward, from one solstice to the other, is an ayana or half-year, two ayanas making one year. Also the equinoctial and solstitial points, the term for the solstice being ayananta. Finally, ayana signifies circulatory courses or circulations, as of the universe.

Ayanamsa - Ayanamsa is the Sanskrit term for the longitudinal difference between the tropical or Sayana and sidereal or Nirayana zodiacs. It is defined as the angle by which the sidereal ecliptic longitude of a celestial body is less than its tropical ecliptic longitude.

The sidereal ecliptic longitude of a celestial body is its longitude on the ecliptic defined with respect to the "fixed" stars.

The tropical ecliptic longitude of a celestial body is its longitude on the ecliptic defined with respect to the vernal equinox point.

Since the vernal equinox point precesses westwards at a rate of 50".29 per year with respect to the fixed stars, the longitude of a fixed body defined with respect to it will increase slowly. On the other hand, since the stars "do not move" (this ignores the effect of proper motion) the longitude of a fixed body defined with respect to them will never change.

Ayanachalana - See Precession of the equinoxes (synonym kraantipaatagati)

Ayanaantha - Solstice

Ayanabhaaga - Amount of precession. i.e. arc of the ecliptic lying between the vernal equinox and the Indian zero point, synonym Ayanaaamsa

B

Bhakti Yoga, भक्ति - An approach to worship and spiritual practice in the Hindu tradition characterized by personal devotion to a divinity , often mediated by a holy person or teacher somewhat akin to the relationship with Christ among certain sects and adherents of Christianity

Bhartrihari, भर्तरिहरि - Bhartrihari along with Panini and Patanjali who preceded him by several centuries is regarded as one of the main contrbutors to the field of linguistics in ancient India. He introduced the notion of

shabda tattwa or shabda pramaanam, namely "the notion of the originary word (shabda) as transcending the bounds of spoken and written language and meaning. Understood as shabda tattva-the "word principle," this complex idea explains the nature of consciousness, the awareness of all forms of phenomenal appearances, and posits an identity obtains between these, which is none other than Brahman. It is thus language as a fundamentally ontological principle that accounts for how we are able to conceptualize and communicate the awareness of objects. The metaphysical notion of shabda Brahman posits the unity of all existence as the foundation for all linguistically designated individual phenomena

BhAshya, भाश्य - Commentary on a celebrated or scriptural work (e.g. Adi Sankara's BhAshya on the Bhagavad Gita)

Bhoodivas - A terrestrial day

Bhoogola - The sphere of the earth

Brahm-acharya - Or student life, when a boy lives with his teacher (Guru) and receives both religious and secular instruction. The youth is trained in self control, and acquires such virtues as chastity, truthfulness, faith, and self surrender

Brahmana, ब्रह्मण - the correct pronunciation includes a short 'a' vowel at the end, the first 'a' is a long vowel while the second is a short one. The literal meaning is one who attains Brahman is a Brahmana - Brahavit Brahaiva bhavati - is the sruti and is the strict definition of a Brahmana. In this day and age it is difficult to fathom in a short period of time whether a particular person has realized Brahman or not. In such a circumstance one looks for adherence to the ethical values of the Hindu and whether the person has the qualities mentioned therein. One of the 4 varnas of society possessing a predominantly static guan amongst the three guNAs (Traigunya) rajas, tamas and satva. The Sanaatana Dharma strove to inculcate a meritocracy and recognizes everybody is not capable of meeting the same challenges. It is not a one size fits all ideology. The Dharma also recognizes there is diversity in the human species that not everybody can become a doctor or a star football player and that the person by reason of his guNAs may not have the inclination, fortitude and desire to put in the long years of training necessary to become a doctor. These differences are not necessarily related to ones appearance or even heredity but have to do with whether a person has the discipline, the single minded focus and fortitude to undertake the arduous task of becoming a doctor or a Vedic priest or a star football player. Every fetus has the potential for fulfillment and Moksha but whether every single person rises to the demands of the tradition is a different matter, despite the fact that it is within the reach of each and every individual. In the modern era the Brahmana has adapted himself to the rigors and demands of a predominantly technological milieu and has filled many roles such as Doctor, Engineer, lawyer, Journalist, politician, think tank adviser, Professor, corporate executive, in addition to being a priest. Even so, the priestly Brahmana community remains one of the poorest in India today.

Brahmana, ब्रह्मण - texts associated with each Veda

Brahmavidya,ब्रह्मविद्य - Brahmavidya or Paravidya (metaphysics metaknowledge or higher knowledge) is the vehicle for attaining Moksha in the path known as Jnana Yoga and Yogasastra(the means to attain the same) is the practical discipline needed to attain Brahmavidya

Brahmanism - Brahmanism is an ersatz terminology used to describe Sanatana Dharma that has become popular in certain circles in the west. It is clear that the Dharma is a whole family of beliefs and darshanas. It has been thus since a very long time. The Vedic texts have survived several millennia of wars and natural disasters, but it is quite possible other texts have been lost. It has never been the contention of Hindus that the Vedas are the only canon

to have originated in the Indian subcontinent. But it is clear that they are among the few to survive over the millennia. Furthermore the implication that Brahmanas had exclusive control over the content and practice of the faith is demeaning and insulting to the Sanatana Dharma which has had a longline of Rishis and Sages who have expounded on the faith few of whom have been Brahmanas. Belief systems that did not subscribe to the Vedic canon have been extant for a very long time and have been known as Nastik Dharmas and include among others Charvaka, Jainism and Buddhism. It is therefore unnecessary to invent a new word Brahmanism to describe an ancient faith which has a perfectly good name namely Sanatana Dharma. To use the word Rabbi-ism to describe the faith taught in Synagogues simp

Brahmi script ब्रह्मी - Brahmi is a "syllabic alphabet", meaning that each sign can be either a simple consonant or a syllable with the consonant and the inherent vowel /a/. Other syllabic alphabets outside of South Asia include Old Persian and Meroïtic. However, unlike these two system, Brahmi (and all subsequent Brahmi-derived scripts) indicates the same consonant with a different vowel by drawing extra strokes, called *matras*, attached to the character. Ligatures are used to indicate consonant clusters. The Brahmi script was first deciphered by James Princep although I find it difficult to believe that they could not find a single Indian who was capable of deciphering the Brahmi script.

C

Caste - Derived from Portuguese Casta, Caste has a meaning quite distinct from Varna which has been accepted as being part of the tradition. Caste according to the Portuguese means a race or a breed. Varna makes no such distinction and to ascribe racial motivations for a system based on division of labor depending on individual inclinations and which is a meritocracy to boot, is totally unconscionable, but that is exactly what the colonial power did with great success . The Sanatana Dharma makes no apologies for being a meritocracy based on competency and character and it is only after the advent of colonial rule that it took on the character of a racial and ethnic division based on birth. It is a tribute to the tenacity and persistence of the British that their viewpoint has prevailed and has been internalized by the Indic population for the most part. Yet it behooves those of us who know better to keep reminding everybody that the colonial viewpoint reflects a conjured up reality that has no relation to a core value nor is it derived from core beliefs held since antiquity. see also Varnashrama dharma.

Celestial (Equatorial)Coordinate System - the most commonly used astronomical coordinate system for indicating the positions of stars or other celestial objects on the celestial sphere . The celestial sphere is an imaginary sphere with the observer at its center. It represents the entire sky; all celestial objects other than the earth are imagined as being located on its inside surface. If the earth's axis is extended, the points where it intersects the celestial sphere are called the celestial poles; the north celestial pole is directly above the earth's North Pole, and the south celestial pole directly above the earth's South Pole. The great circle on the celestial sphere halfway between the celestial poles is called the celestial equator; it can be thought of as the earth's equator projected onto the celestial sphere. It divides the celestial sphere into the northern and southern skies. An important reference point on the celestial equator is the vernal equinox , the point at which the sun crosses the celestial equator in March. To designate the position of a star, the astronomer considers an imaginary great circle passing through the celestial poles and through the star in question. This is the star's hour circle , analogous to a meridian of longitude on earth. The astronomer then measures the angle between the vernal equinox and the point where the hour circle

intersects the celestial equator. This angle is called the star's right ascension and is measured in hours, minutes, and seconds rather than in the more familiar degrees, minutes, and seconds. (There are 360 degrees or 24 hours in a full circle.) The right ascension is always measured eastward from the vernal equinox. Next the observer measures along the star's hour circle the angle between the celestial equator and the position of the star. This angle is called the declination of the star and is measured in degrees, minutes, and seconds north or south of the celestial equator, analogous to latitude on the earth. Right ascension and declination together determine the location of a star on the celestial sphere. The right ascensions and declinations of many stars are listed in various reference tables published for astronomers and navigators. Because a star's position may change slightly (see proper motion and precession of the equinoxes), such tables must be revised at regular intervals. By definition, the vernal equinox is located at right ascension 0 h and declination 0°.

Celestial equator,**नाडिव्रुत** Nadivruth,Nadivalaya - The great circle on the celestial sphere halfway between the celestial poles is called the celestial equator.

D

Dakshinayana - The southward journey of the Sun towards the Winter solstice, from its northernmost point during the Summer solstice usually identified as Dakshinayana Punyakala on July 16.

Dasha - Ten as in Dashaavatara,, the ten Avatars of Vishnu

Decimal system - see also place value system, decimal system [Latin= of tenths], numeration system based on powers of 10. A number is written as a row of digits, with each position in the row corresponding to a certain power of 10. A decimal point in the row divides it into those powers of 10 equal to or greater than 0 and those less than 0, i.e., negative powers of 10. Positions farther to the left of the decimal point correspond to increasing positive powers of 10 and those farther to the right to increasing negative powers, i.e., to division by higher positive powers of 10. For example, 4,309=(4x10**3)+(3x10**2)+(0x10**1)+(9x10**0)=4,000+300+0+9, and 4.309=(4x10**0)+(3x10**-1)+(0x10**-’2)+(9x10**-’3)=4+3/10+0/100+9/1000.

It is believed that the decimal system is based on 10 because humans have 10 fingers and so became used to counting by 10s early in the course of civilization. The decimal system was introduced into Europe c.1300. It greatly simplified arithmetic and was a much-needed improvement over the Roman numerals, which did not use a positional system. A number written in the decimal system is called a decimal, although sometimes this term is used to refer only to a proper fraction written in this system and not to a mixed number. Decimals are added and subtracted in the same way as are integers (whole numbers) except that when these operations are written in columnar form the decimal points in the column entries and in the answer must all be placed one under another. In multiplying two decimals the operation is the same as for integers except that the number of decimal places in the product, i.e., digits to the right of the decimal point, is equal to the sum of the decimal places in the factors; e.g., the factor 7.24 to two decimal places and the factor 6.3 to one decimal place have the product 45.612 to three decimal places. In division, e.g., 4.32 /12.8 where there is a decimal point in the divisor (4.32), the point is shifted to the extreme right (i.e., to 432.) and the decimal point in the dividend (12.8) is shifted the same number

of places to the right (to 1280), with one or more zeros added before the decimal to make this possible. The decimal point in the quotient is then placed above that in the dividend, i.e., 432|1280.0 zeros are added to the right of the decimal point in the dividend as needed, and the division proceeds the same as for integers. The decimal system is widely used in various systems employing numbers. The metric system of weights and measures, used in most of the world, is based on the decimal system, as are most systems of national currency.

Dharma - one of the four kinds of human aspirations, which are dharma, artha, kAma and moksha. dharma: "Righteous living." The fulfillment of virtue, good works, duties and responsibilities, restraints and observances - performing one's part in the service of society. This includes pursuit of truth under a guru of a particular Parampara and sAmpradaya. Dharma is of four primary forms. It is the steady guide for artha and kama.

Dharma(Baudhik) - A central notion of Buddhism, used in various contexts;

1.The cosmic law, the great norm, underlying our world; above all the law of karmically determined rebirth

2. The teaching of the Buddha, who recognized and formulated this law; thus the teaching exdpresses the universal truth. The Dharma in this sense existed before the birth of the historical Buddha, who is no more than a manifestation of it. This is the Dharma in which the Buddhist takes refuge.

3. Norms of behavior and ethical rules.

4.Manifestation of reality, of the general state of affairs

Dravidian languages - An unverifiable hypothesis made to distinguish the languages of the south of India (Dravida) from those of the north. In reality, a Telugu speaking person , ostensibly a Dravidian language, can understand Sanskrit far more readily than even an accomplished scholar in sanskrit in the west. This despite the putative similarity between the European languages and Sanskrit.

Drkchaya - Parallax

Druhyu - One of 5 clans namely Anus, Druhyus, Turvashas, Puru, Yadu, the sons of Yayati. Druhyu is the 3rd son of Yayati. His dynasty is listed in Chapter 23 of the Bhagavata Puraana.The descendants of Druhyu eventually went on to become Zarathushtrans , followers of Zarathushtra(**Dhrutashtra**) and subsequently formed the Aryamanush (Greek corruption Achaemenid) empire, e.g. Darius = Druhyu(Skrit) Daryavahyu (Persian) . Some of the ancient parsian kings belonging to the Aryamanush Dynasty

- **Haxamanish** or ACHAEMENES, first King of Persia, was mythical.
- **Teispes** c. 7th century BC. (this is the Greek version of the name)
- **Kurash I** (or CYRUS I) c. late 7th Century BC, son of Teispes.
- **Ariaramnes** c. late 7th century BC, son of Teispes.
- **Kambujia I** (or CAMBYSES I) ? - 559 BC, son of Kurash I.
- **Kurash II** (or CYRUS II) 559 - c. 550 BC when he became King of Kings, son of Kambuyia I.

For other Old Persian Sanskrit names see for instance,

http:/indicstudies.us/Archives/Linguistics/Persian names. I recommend all the readers of Indic origin (and others)use S'kritic names for Iranian kings. That will force us into a thought process that they were all a part of the Vedic civilization.

E

Ecliptic क्रांतीव्रुत kraanthivruth - the great circle on the celestial sphere that lies in the plane of the earth's orbit (called the plane of the ecliptic). Because of the earth's yearly revolution around the sun, the sun appears to move in an annual journey through the heavens with the ecliptic as its path. The ecliptic is the principal axis in the ecliptic coordinate system . The two points at which the ecliptic crosses the celestial equator are the equinoxes . The obliquity of the ecliptic is the inclination of the plane of the ecliptic to the plane of the celestial equator, an angle of about 23 1/2 °. The constellations through which the ecliptic passes are the constellations of the zodiac .

Ekadasi, एकादिस - Ekadasi is the eleventh lunar day (Tithi) of the Shukla (bright) or Krishna (dark) Paksha (fortnight) respectively ,of every lunar month in the Hindu calendar (Panchanga).In Hinduism and Jainism, it is considered spiritually beneficial day. Scriptures recommend observing an (ideally waterless) fast from sunset on the day prior to Ekadasi until 48 minutes after sunrise on the day following Ekadasi. Ekadasi is a Sanskrit word, which means 'the eleventh'. It refers to the eleventh day of a fortnight belonging to a lunar month. There are two fortnights in a lunar month—the bright and the dark. So, Ekadasi occurs twice in a month, in the bright fortnight and the dark fortnight. The special feature of Ekadasi, as most people know it, is a fast, abstinence from food. This is how it is usually understood. In fact, the fast is only a practical expression and a symbol of something else that we are expected to do, which is of special significance to our personality.

Epicycles - In the Ptolemaic system of astronomy, the epicycle (literally: on the circle in Greek) was a geometric model to explain the variations in speed and direction of the apparent motion of the Moon, Sun, and planets. It was designed by Apollonius of Perga at the end of the 3rd century BC. In particular it explained retrograde motion. Secondarily, it also explained changes in the distance of the planet from Earth.

Epistemology - The Theory of Knowledge is concerned with the means of acquiring knowledge. The root of the English word is the Greek word episteme meaning knowledge. This includes logical argument or reasoning, inference, testimony, and perception. All these words have precise equivalents in Sanskrit and the word for epistemology in Sanskrit is Praamanya, the theory of knowledge. The systematic study of the theory of knowledge goes back to great antiquity and the names associated with these disciplines include among others Pannini, Patanjali. Yajnavalkya and Bhartrihari. It is our contention that most if not all of these savants lived in the millenium prior to the Christian era.

Equinox, vernal equinox वसंत संपत ,(Vasanth Sampat),autumnal equinox - either of two points on the celestial sphere where the ecliptic and the celestial equator intersect. The vernal equinox, also known as “the first point of Aries,” is the point at which the sun appears to cross the celestial equator from south to north. This occurs about Mar. 21, marking the beginning of spring in the Northern Hemisphere. At the autumnal equinox, about Sept. 23, the sun again appears to cross the celestial equator, this time from north to south; this marks the beginning of autumn in the Northern Hemisphere. On the date of either equinox, night and day are of equal length (12 hr each) in all parts of the world; the word equinox is often used to refer to either of these dates. The equinoxes are not fixed points on the celestial sphere but move westward along the ecliptic, passing through all the constellations of the zodiac in 26,000 years. This motion is called the precession of the equinoxes . The vernal equinox is a reference point in the equatorial coordinate system .

Equator - See Vishuvat

F

Four noble truths ,आर्य सत्य - (Baudhika)

There is suffering (dukkha) in the world.

Suffering arises out of desire

It is possible to end suffering

The way to end suffering is to adopt the eightfold path (ashtaangika marga)

G

Gaudapada - Proponent of Advaita Vedanta and well versed in Buddhism. His most celebrated work is the Kaarika (Gloss) on the Mandukya Upanishad

Gotra - A term applied to a clan, a group of families, or a lineage - exogamous and patrilineal - whose members trace their descent to a common ancestor, usually a Rishi of theVedic era. Atreya ,Bharadvaja ,Dhananjaya ,Gautam ,Haritasa ,Kaushika ,Kashyapa ,Kaundinya ,Kutsasa ,Lomash ,Mandvya ,Mouna Bhargava ,Mudgala Maudgalya, Moudgil, Modgil ,Parashara ,Sangar ,Sankyanasa ,Shandilya,Somnasser ,Srivatsa ,Upamanyu ,Vadula ,Vashishta ,Vatsa ,Veetahavya ,Viswamitra ,Yaska

Gregorian Calendar Reform

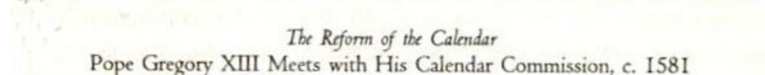
When Julius Caesar took power in Rome, the Roman calendar had ceased to reflect the year accurately. The provision of adding an intercalary month to the year when needed had not been applied consistently, because it affected the length of terms of office.

The Julian reform lengthened the months (except February, owing to its religious significance) and provided for an intercalary day to be added every four years to February, creating a leap year.

This produced a noticeably more accurate calendar, but it was based on the calculation of a year as 365 days and 6 hours (365.25 d). In fact, the year is 11 minutes and 14 seconds less than that. This had the effect of adding three-quarters of an hour to a year, and the effect accumulated. By the sixteenth century, the vernal equinox fell on March 10.

Under Pope Gregory XIII the leap rule was altered: century years, which are divisible by four, would not be leap years unless they are also divisible by 400. This makes the mean year 365.2425 days (365 d, 5 h, 49 min, 12 s) long. While this does not synchronize the years entirely, it would require 35 centuries to accumulate a day. This new calendar was synchronized with the traditional seasons again and was not applied to dates in the past, which caused a leap of at least ten days from the final day the Julian calendar was in effect. Thus the day after October 4

1582 was named October 15, 1582 and the 11 days in between are completely missing. This reform slowly spread through the nations that used the Julian calendar, although the Russian church year still uses the Julian calendar. The times varied so widely that some countries had to drop more than ten days: Great Britain, for instance, dropped eleven because the new Gregrpian calendar was adopted only in .



The Reform of the Calendar
Pope Gregory XIII Meets with His Calendar Commission, c. 1581

Reformers cite several problems with the Gregorian calendar:

- It is not perpetual. Each year starts on a different day of the week and calendars expire every year.
- It is difficult to determine the weekday of any given day of the year or month.
- Months are not equal in length nor regularly distributed across the year, requiring mnemonics (e.g. “Thirty days hath September…”) to remember which month is 28, 29, 30 or 31 days long.
- The year’s four quarters (of three full months each) are not equal. Business quarters that are equal would make accounting easier.
- Its epoch (origin) is not religiously neutral. The same applies to month and weekday names in many languages.
- Each month has no connection with the lunar phases.

It is impossible to solve all these issues in just one calendar.

$360 \div 7 = 51^{3}/_{7}$	$360 \div 12 = 30$
$364 \div 7 = 52 = 4 \times 13$	$364 \div 12 = 30^{1}/_{3}$
$365 \div 7 = 52^{1}/_{7}$	$365 \div 12 = 30^{5}/_{12}$

$366 \div 7 = 52\frac{2}{7}$ $366 \div 12 = 30\frac{1}{2}$

Most plans evolve around the solar year of little more than 365 days. This number does not divide well by seven or twelve, which are the traditional numbers of days per week and months per year respectively. The nearby numbers 360, 364 and 366 are divisible in better ways. There are also lunar centric proposals.

Grihastya - The second stage of the varna ashrama system,namely that of a householder ormarried man or woman.

Gunas - There are 3 Gunas , Sattwa, Rajas and Tamas and these three Gunas occur in each and every individual in varying degrees. The relative proportion of each in the total determines the essential nature of the individual. It follows that at any given time a individual, may exhibit different modes of behavior as his personality matures and develops. The son of a Brahmana may choose not to follow the priestly vocation and may elect to go into law. As a general rule of thumb one elects to be in a profession which utilizes his Gunas fully. For example Brahmanas tend to cluster around intellectual pursuits (teaching, legal, corporate management, administration etc. In the past the choice of professions available to Brahmanas were limited to priestly duties and the services he could render as a Minister to the Maharaja including mundane tasks such as accounting and cooking. In recent years substantial numbers of Brahmanas faced with increasing discrimination from their own government have elected to go into Business, so that his varna is that of a Vaisya, unless he maintains his competency and knowledge of the Vedic scripture and adheres to the injunctions of a Brahmana. Most Indian philosophers accept the view of the Samkhya philosophy when it refers to the definition of the Gunas and their relationship to Prakriti and Purusha.

Guna varna Vyavastha - The Varna system, namely Guna Varna Vyavastha, that produced the Varnashrama Dharma was conscious of the fact that this was the world's early attempt at a meritocracy. That the system was eminently successful in its own way , I have no doubt because the resulting civilization flourished for well over 5 millennia, until its very foundations were attacked by barbarians from both within and without; by barbarians, whose notion of entertainment was to build a pyramid of skulls, in order to terrorize the local population to capitulate. The current system in place after the colonial power was done reinventing and reshaping it to its own specifications, and which goes by the name Caste, is so utterly different in all significant ways, that we can safely say it has little to do with the Hindu faith or Hindu traditions such as the Guna Varna Vyavastha. The vedic division of people into 4 Varnas (Brahmana, Rajanya, Vaisya and Shudra) is by Guna and Guna only and is known as the Guna Varna Vyavastha. The Asrama system refers to the four stages of one's life, namely Brahmacharya (life of an unmarried student), Grihasthya (life of a householder), Vanaprasthaya (life of a retired householder), sannyasa (life of a monk)

H

Hinduism - Also known as Sanaatana Dharma, the eternal faith; there are roughly 900 million Hindus in the world as of 2008 (see Dharma)

I

Indo-Aryan languages - A family of languages spoken over a large area of the Eurasian land mass;see Indo-European Languages

Indo-European languages - A family of languages spoken over a vast geographical area from India to most parts of Europe.

Indo-Iranian languages - the Indo Iranian branch of the Indo Europrean language family, spoken in central asia,iran and the Indian subcontinent

Indology - Indology is a name given by Indologists to the academic study of the history, languages, and cultures of the Indian subcontinent. Strictly speaking it encompasses the study of the languages, scripts of all of Asia that was influenced by Indic culture It may be surprising to learn that the first pioneer in Indology was the 12th Century Pope, Honorius IV. The Holy Father encouraged the learning of oriental languages in order to preach Christianity amongst the pagans. Soon after this in 1312, the Ecumenical Council of the Vatican decided that-"The Holy Church should have an abundant number of Catholics well versed in the languages, especially in those of the infidels, so as to be able to instruct them in the sacred doctrine." The result of this was the creation of the chairs of Hebrew, Arabic and Chaldean at the Universities of Bologna, Oxford, Paris and Salamanca. A century later in 1434, the General Council of Basel returned to this theme and decreed that –"All Bishops must sometimes each year send men well-grounded in the divine word to those parts where Jews and other infidels live, to preach and explain the truth of the Catholic faith in such a way that the infidels who hear them may come to recognize their errors. Let them compel them to hear their preaching." 1. Centuries later in 1870, during the First Vatican Council, Hinduism was condemned in the "five anathemas against pantheism" according to the Jesuit priest John Hardon in the Church-authorized book, The Catholic Catechism. However, interests in Indology only took shape and concrete direction after the British came to India, with the advent of the discovery of Sanskrit by Sir William Jones in the 1770's. Other names for Indology are Indic studies or Indian studies or South Asian studies. Political motivations have been always dominant in the pursuit of Indological studies right from the outset since the time of Sir William Jones, when he discovered the existence of Sanskrit. In fact the British presence in India was steadily increasing long before the Battle of Plassey in 1757 CE, but so great was the insularity of the colonial overlord that it took almost almost three hundred years for a scholar like Sir William to show up in India after Vasco da Gama landed of the cost of Goa in 1492 CE, and notice the similarities between Sanskrit and the european languages

Indus script - While several decipherments have been proposed including the recent work by Rajaram and Jha [131], it is possible the problem may never achieve a solution satisfactory to both the Indics and the Western indologists. Most Indics believe that this was the forerunner of the Brahmi script. The brahmi script is the progenitor of almost all of the languages and scripts of India and most of the rest of South East Asia .The BrahmI script has all of the phonetic characteristics to be found in all the successor scripts of Asia. To suggest a semitic origin for a Brahmi script is highly problematical since semitic scripts (including all the Roman scripts of Europe) do not have the characteristic Vowel strokes that Brahmi scripts have whenever a vowel is appended to a consonant such as in आचार्य (the long 'a' vowel is represented by a vertical stroke). The name Brahmi suggests that the script was developed along the banks of the Sarasvati river, since Brahmi is synonymous with Sarasvati

Indus Valley Civilization or Harappan Civilization - AKA Sarasvati Sindhu Civilization (SSC), the civilization that endured for several millennia in the Sarasvati and Sindhu (Indus) river valleys the people who inhabited these valleys are also referred to as the Vedic Harappans by Bhagwan Singh. Most of the recent excavations indicate a

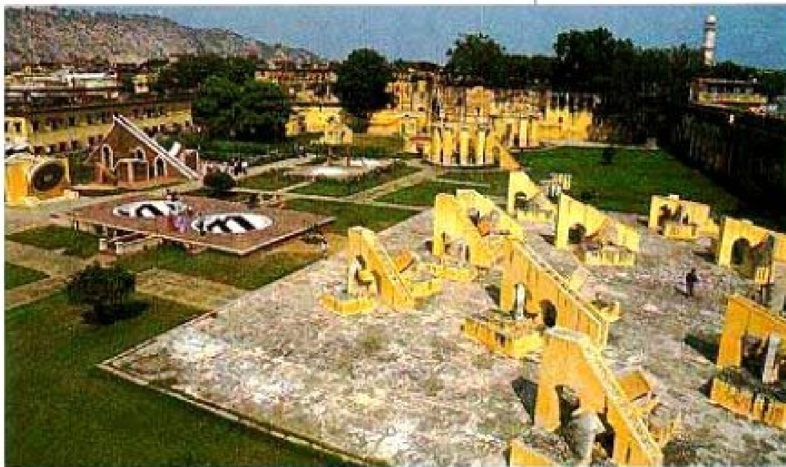
[131] Rajaram, N . S., and N Jha, "The deciphered Indus script" .Aditya Prakashan, Delhi , 2005, ISBN 8177420151

heavy preponderance of settlements, about 400 in number on the banks of the dried up Sarasvatii river. Mohenjo Daro and Harappa represent a late phase of the civilization. European Indologists go to extraordinary lengths to make a distinction between the Vedic civilization and the SSC despite the fact they are located spatially and temporally in the same place and time. That they got away with this subterfuge for such a long time (it is still the official version of History in Indian text books) is a tribute to the farsightedness and tenacity of successive British administrators and scholars who always put British national interest before every other criterion including the truth. Their reasons for engaging in such intellectual dishonesty are chronicled in The South Asia File[132]

Iranian peoples - The ancient Iranians or Avestans, the people who composed the Avesta, have much in common with the Vedics. In fact it is believed by some that the Iranians are descended from the Druhyus. The language of the Avesta is easily discernible to those familiar with Sanskrit and the names of Persian Kings (the original names not the Greek version we learned in English history books) For instance the Sanskrit or Iranian version of Darius is Druhyu. It is surmised that a branch of the Bhrigu Rishi family, eventually composed the Avesta and that Dhritarashtra (Zoroaster) the founder of the Parsee religion, was a Bhrigu

J

Jantar Mantar



A series of astronomical observatories built by Maharaja Jai Singh of Jaipur, the most well known of which is the one in Delhi. See for instance

http://www.crystalinks.com/indiastronomy.html

Jnana Yoga ज्नान - the path of knowledge Jñāna (also spelled "Gyāna"; Devanagari घ्यान**)** is the Sanskrit term for knowledge. In Hinduism it means true knowledge, PAra Vidya, the knowledge that one's self atman is Ultimate Reality Brahman. In Buddhism, it refers to pure awareness that is free of conceptual encumbrances, and is

[132] The South Asia File,

contrasted with Vijnana, which is a moment of 'divided knowing'. Jnana yoga is one path (marga) towards moksha (liberation), while Yoga offers different paths for different temperaments such as Bhakti and Karma Yoga.

Jivanmukta - Adi Sankara gives the true definition of a Jivanmukta - The great souls he says , calm and tranquil, live, regenerating the world like the spring; and themselves having crossed the ocean of embodied existence, and death, help those who struggle, for the same end, without the least trace of personal motives or advantage

Jyotisha - one of the 6 Vedangas, also known as the science of light .It includes the study of the motion of Celestial Objects or Astronomy and the effects of the forces arising from these bodies and their effects on the human mind. It is the hypothesis of Vedic Astrology that such effects can be predicted by studying the relative location of the planets and the stars . Jyotisha is often discussed as the instructional element of the Rig Veda, and as such is a Vedangas, or "body part" of the Vedas. Jyotisha is called the Eye of the Veda, for its believed ability to view both phenomenal reality and wisdom itself. Part of a larger Vedic curriculum including mathematics, architecture, medical and military applications. The author of this Vedanga is purported to be one **Lagadha**

K

Kalidasa, कालिदास - The poet laureate of ancient India. The author of the most widely known text and play Shakuntala

Kalpasutras - constitutes part of the Vedanga consists of Grhyasutras, Dharmasutras, Sulvasutras, Srautasutras.

KAma, काम - "Pleasure,desire,wish, love; enjoyment." Earthly love, aesthetic and cultural fulfillment, pleasures of the world (often used in the sense of sexual desire, but not necessarily so), the joys of family, intellectual satisfaction. Enjoyment of happiness, security, creativity, usefulness and inspiration. An essential ingredient for the emotional health of an individual and recognized as such by the ancient Vedics. Kama is one of the four Purusharthas or goals of life, the others being dharma , artha and moksha.

Kaarika - Gloss or explanatory text of an original text, such as the Kaarika of the Mandukya Upanishad by Gaudapada

Karma Yoga - Karma yoga, or the "discipline of action" is based on the teachings of the Bhagavad Gita, a holy scripture of Hinduism. One of the four pillars of yoga, Karma yoga focuses on the adherence to duty (dharma) while remaining detached from the reward. It states that one can attain Moksha (salvation) by doing ones duties in an unselfish manner. A great portion of the Bhagavad Gita is engaged in discussing the efficacy of various Yogas towards the goal of self realization or Moksha. Initially Arjuna is bewildered, when Bhagavan says that the Yoga of Knowledge is superior to the Yoga of action , even though desireless it may be. Why then do you ask me to fight asks an exasperated Arjuna of his friend and mentor, if such be the case. The answer by Bhagavan and elucidated by Adi Sankara in his Bhashya is one of the major insights of this lovely Celestial song. As explained by Adi Sankara, Karma Yoga consists of 4 principles 1. Giving up an egoistic attitude (BG 18-46),2. Giving up the hankering for the fruits or results of one's action (BG 2-39), 3. Maintaining equanimity in the face of desirable andhappy circumstances as well as undesirable and not so pleasant situations (BG 2-48) 4. Surrendering of all actions as an offering to the Lord Ishwara) wholeheartedly (BG 3-33). It is possible to transcend Karma Yoga by the Yoga of Knowledge, which is in fact the superior approach, but such an alternative is not for every individual , and is best suited for those who have realized Brahman

Khagola - Celestial sphere or armillary sphere, a term used for both the geometrical celestial sphere as well as the astronomical instrument called the armillary sphere.

Kshatriya, क्षत्रिय - the varna identified in the classical Indic tradition as those entitled to exercise military power and perform sacrifices, the dominant Guna in the Kshatriya varna is one of Rajas, and a passion for action. It is your Dharma to engage in action protect the aged and infirm and the children and women in your protection. It is better to follow ones own Dharma (dictated by ones Gunas) admonished Sri Krishna to Arjuna than to try something, however beguiling, which is not so suited

Kurgan - a region in Europe from where the putative emigration of the mythical Aryan race took place

Kushana Empire -

M

Madhavacharya - Celebrated religious teacher and scholar of the 14th century, one of the main teachers of the Dvaita-Vedanta school of pronounced dualism. It teaches the existence or permanent reality of two fundamental principles in universal nature: spirit and matter, or divinity and the universe. This dualism is in direct contrast with the unity doctrine taught in the Advaita-Vedanta or nondualistic system of Sankaracharya.

Mahavrata - winter solstice

Mahaavaakya, महावाक्य -

The 4 expressions that embody Vedanta, the essence of attaining Jivanmukta.

The Mahaavaakyas are the four "Great Sayings" of the Upanishads, foundational religious texts of Hinduism.

These four sayings encapsulate the central Truth of Hinduism.

The Mahaavaakya are:

1) *Prajnaanam Brahman* "Conscious is Brahman" (Aitareya Upanishad 3.3).

2) *Ayam Atma Brahman* "This Self (Atman) is Brahman" (Mandukya Upanishad 1.2)

3) *Tat Tvam Asi* - "That Thou art " (Chandogya Upanishad 6.8.7)

4) *Aham Brahmasmi* - "I am Brahman" (Brihadaranyaka Upanishad 1.4.10)

All four of these, in one way or another, indicate the unity of the individual human being with Brahman. Brahman is Absolute Reality, Cosmic Consciousness, the fundamental Primordial essence from which all divinities and all worlds arise and the Dharma asserts that each human being, in her or his innermost self, is this ultimate transcendent God-Reality. It is through practices like yoga, and meditation that the individual can realize her or his unity with the Divine and escape bonds of this world. The most forthright statement of the above proposition is to be found in texts propounding Advaita Vedanta**.** The Bhagavad Gita is one of the texts that enumerate the various paths one may take to attain Jivanmukta

Mananam - part of the process of gathering of knowledge using techniques such as sravanam,mananam and nididhyasanam. Mananam means to ponder over the material that one has read or heard

Metonic cycle (see also Adhikamaasa) - a cycle whereby every three years a lunar month is added to bring the lunar cycle in synchronization with the solar cycle. It turns out that it takes nineteen years to bring the two cycles in synchronization, so that a new moon occurs exactly on the same solar day that it did 19 years ago. When combined with the 4 year cycle used in the Julian calendar, yields a total cyclic time of 7*4*19 = 532 years, This is the time in years, that has to elapse in order for the same weekday to occur on the same date, for every month of th eyear. It is attributed to Meton, the Greek astronomer and now is credited to Babylonian astronomers, in the 5th century BCE, but should properly be credited to Yajnavalkya in the Satapatha Brahmana, who first postulated the

95 year old synchronization cycle. The higher number was necessitated by the greater accuracy of the observations and the greater accuracy that the Ancient Indics demanded in the final result

Mitanni - when the Hittite and the Mitanni (2 neighboring kingdoms in Anatolia, present day Turkey signed a treaty they invoked the blessings of their Gods . The invocation is addressed to the Nasatyas, Mitra and Varuna, Hindu Vedic deities from a distant past

Moksha - "Liberation." Is synonymous with Freedom from rebirth through the ultimate attainment, realization of the Self God, PArasiva. The spiritual attainments and superconscious joys, attending renunciation and yoga leading to Self Realization. Moksha comes through the fulfillment of dharma, artha and kAma (known in Tamil as aram, porul and inbam, and explained by Tiruvalluvar in Tirukural) in the current or past lives, so that one is no longer attached to worldly joys or sorrows. It is the supreme goal of life, called paramartha. This is a distinction between the DhArmic traditions originating in the Indian subcontinent from the very earliest time periods in history and other religious belief systems. The propensity to cater to the higher needs (in the Maslow hierarchy) from the very inception of the tradition is a uniquely Indic development. Merely to emphasize this as a spiritual characteristic is to mnimize the pragmatic and psychological needs of the human species . Paying special attention to the fulfillment of these needs is a distinctive characteristic of Indic dharma.

Mumukshutwa - An intense thirst for Brahmavidya or higher knowledge (Paara Vidya)

N

Nakshatras - The concept of positing 27 Nakshatras in the sidereal zodiac goes back to antiquity at least in India. The ancients divided the sky in 27 or 28 lunar mansions or Nakshatras, characterized by asterisms (apparent groups of stars), one for each day that the Moon follows its track among the stars.

Naksatra-vidya - The astronomical aspect of Jyotisha (which includes Astrology

Nididhyasanam - the final step of the 3 step process of sravanam, mananam, nididhyasanam, involves deep meditation and requires mumukshutwa and titiksha

Nirukta - this treatise was authored by Yaska and deals with Etymology , a branch of Linguistics, the study of the roots of all words, made simpler by the intentional highlighting of Dhaatu in sanskrit. Yaska is one of the bright galaxy among the plethora of broad spectrum philosophers in the ancient Vedic era, who counted numerous skills in their repertoire linguistics being just one of their many fields of expertise

Nighantu - Yaska's Vedic Glossary,Nirukta is a commentary on the Nighantu

Nirvana - blown out or extinguished as in the case of a lamp. Nirvana is generally used to refer to a material life that has been extinguished, i.e. for one who has achieved freedom from rebirth. The term Nirvana is commonly

used in Buddhism as the final stage a practitioner strives for . The word does not mean heaven and is analogous to Moksha in the Sanaatana dharma

Nischitaaartham, **निस्चितार्थम** - Engagement ceremony prior to a wedding. Literally means 'firming up' of the relationship and is usually commemorated with a Puja and an exchange of rings, gifts and invitations to the wedding ceremony

P

Pancha – sanskrit term for five e.g. Panchabana,panchatantra

Parampara,परंपरा - tradition,as in likhita Parampara (written tradition), srauta **Parampara** (oral tradition), guru Parampara, (the guru-disciple tradition)

Place Value System,स्थान - the most common Sanskrit word for this is sthana which literally means place, and refers to the decimal system of numbers where the value of a number is determined by its location with respect to other numbers to the right , e.g. 3 followed by a 0 , means the number is thirty

Poornima,पूर्निम - full moon

Pope Gregory XIII (Ugo Bioncompagni,1502 – 1585)sent missionaries to India (and China) mainly to learn from the Namputhiris of Kerala. He suppressed knowledge that did not agree with thre church dogma and also issued a proclamation that no knowledge,, regardless of its source, be attributed to other than Catholics. In other words he flouted the concept of intellectual property with impunity. The Gregorian Calendar was fixed shortly thereafter (the return of the Jesuits from Malabar.

Purana, पुराण - literally means the ancients. Traditional sanskrit texts dealing with diverse topics such as the creation of the world ,legends, genealogy of sovereigns, In the Indic context, puranas have special significance both from a temporal stand point and from a historical perspective

Purusha, Paurusheya, Apaurusheya - In Hinduism, Purusha ("Cosmic Man") is the "self" which pervades the universe. The Vedic divinities are considered to be the human mind's interpretation of the many facets of Purusha. According to the Rigvedic Purusha sukta, Purusha was dismembered by the devas -- his mind is the moon, his eyes are the sun, and his breath is the wind.In Samkhya, a school of Hindu philosophy, Purusha is pure consciousness. It is thought to be our true identity, to be contrasted with Prakrti, or the material world, which contains all of our organs, senses, and intellectual faculties.Amore restrcted meaning of purusha is youth or human (paurusheya).Hinduism in that sense is an Apaurusheya belief system as opposed to the revealed or prophetic faiths such as Judaism,Christianity or Islam which would therefore come under the category of paurusheya religions

PurushArtha - PurushArtha or ManushyArtheha is the pursuit of the four kinds of human aspirations, which are dharma, artha, kAma and moksha. The four pursuits in which humans may legitimately engage, also called chaturvarga, "four-fold good" , is a basic principle of Hindu ethics.

Purvapaska - new moon to full moon period

PramAnam, Epistemology प्रमाणम - the process of gaining knowledge, sometimes used to express the goal as well as the means to attain knowledge, as in Apaurusheya PramAnam

PrAsthanatrAyi - Prasthanatrayi, literally, three points of departure, (IAST Prasthānatrayī) refers to the three canonical texts of Hindu philosophy, especially the Vedanta schools. It consists of: the anishads, known as Upadesha prasthana (injunctive texts),the Brahma Sutras, known as Nyaya prasthana (logical text),the Bhagavad Gita, known as Sadhana prasthana (practical text)

Pratyaksha, प्रत्यक्ष - *Prathyaksha pramaana:* This is called direct proof, as it is perceived by the sense organs. These organs are only instruments. The mind enters them and helps them to function. There are some limitations on the senses like disease and imperfection, that make proof obtained by this method to be infirm. For example, a normal eye can see all colors, a jaundiced eye sees everything as yellow. Though the *laddu* is sweet, the tongue of a malaria patient classifies it as bitter. Here, there are two points of view. From the point of view of the matter it is sweet. But from the point of view of the senses it is bitter. It can be concluded, therefore, direct proof is not complete evidence for real justice.

Precession of the Equinoxes (see also Ayanachalana)see also equinox - The earth revolves around the Sun once in 365 days 5 hours 48 minutes and 46 seconds. Considered from the earth, the Sun appears to complete one round of the ecliptic during this period. This is called a tropical year .In the span of a tropical year, the earth regains its original angular position with the Sun. It is also called the year of seasons since on this Earth-Sun cycle depends the occurrence, and timing, of seasons. If we consider the revolution of the Sun around the earth from one vernal equinox (around 21st March, when the day and night all over the globe are equal) to the next vernal equinox, it takes one tropical year to do so. However, if at the end of a tropical year from one vernal equinox to the next, we consider the position of the earth with reference to a fixed star of the zodiac, the earth appears to lie some 50.26 seconds of celestial longitude to the west of its original position. In order for the earth to attain the same position with respect to a fixed star after one revolution, it takes a time span of 365 days 6 hours 9 minutes and some 9.5 seconds. This duration of time is called a sidereal year .The sidereal year is just over 20 minutes longer than the tropical year. Each year, the Vernal equinox will fall short by 50.26 seconds along the zodiac reckoned along the fixed stars. This continuous receding of the Vernal equinox along the zodiac is called the Precession of the equinoxes.

Proto-Indo-European - PIE for short is a constructed language for which there is no existence theorem . It is based on unproven hypothesis

Proto Dravidian - the alleged hypothetical ancestor language to the modern languages of Telugu, Tamil, Kannada, Tulu and Malayalam. Again there is no proof that a single human ever spoke the language. There is no reference to such a language in any of the vast literary works of India south or north.

R

Rajas - Raajasik individuals are filled with a desire and passion to undertake new projects and goad others into action. Many leaders exhibit a Raajasik temperament

Raja Yoga - Raja Yoga, as outlined by Patanjali, describes eight "limbs" of spiritual practices, half of which might be classified as meditation. Underlying them is the assumption that a yogi should still the fluctuations of his or her mind: *Yoga cittavrrti nirodha.*

Ramayana - a Hindu epic in which Rama, avatar of Vishnu vanquishes Ravana and is reunited with his spouse Seetha

Rig Veda - The earliest and the most prominent of the Vedas, the compositions of the Ancient Indics who we will refer to also as the Vedics,held to be sacred and termed Sruti by many Hindus, the chief characteristic was their oral tradition

Roma_people - The name that the Gypsies are known by in Europe, reflecting their large numbers in Romania

S

Sampradaya, **सांप्रदाय** - In Hinduism, a SAmpradaya is a tradition encompassing a common philosophy but embracing many different schools, groups, or guru lineages (called *parampara*). By becoming initiated (diksha) into a parampara one automatically belongs to its proper sAmpradaya.

Sankaracharya, संकराचार्य - The great proponent of Advaita Vedanta. Bhagavatpada Acharya Sankara was a veritable institution masquerading as an individual There is controversy over the date of his birth, ranging from 509 BCE to 788 CE

Saankhya, **सांख्य** - Saamkhya is considered to be the oldest among the philosophical systems dating back to about 7c BC. Kapila, the author of 'Saamkhya Sutra", is considered to be the originator of this system. The "Saamkhya Karika" of Ishwarakrishna is the earliest available text on Saamkhya dating to about 3c AD. Saamkhya's name is derived from root word Saamkhya (enumeration) and is reflective than authoritative. Well-known commentaries are Gaudapada's bhasya, Vacaspati Misra's Tattwa-kaumudi, Vijnanabhiksu's Saamkhya-pravacanbhasya, and Mathara's Matharavrtti.

The Saamkhya system proposes the theory of evolution (prakriti-purusha) that is accepted by all other systems. The purusha (soul) of this system is unchanging and is a witness to the changes of prakriti. Hence the Saamkhya system is based on dualism wherein nature (prakriti) and conscious spirit (purusha) are separate entities not derived from one another. There can be many purushas since one man can attain enlightenment while the rest do not, whereas prakriti is one. It is identified with pure objectivity, phenomenal reality, which is non-conscious.

Prakriti possess three fundamental natures; (1) The pure and fine Sattva (2) the active Rajas and (3) the coarse and heavy Tamas. Sattva accounts for thought and intelligibility, experienced psychologically as pleasure, thinking, clarity, understanding and detachment. Rajas accounts for motion, energy and activity and it is experienced psychologically as suffering, craving and attachment. Tamas accounts for restraint and inertia. It is experienced psychologically as delusion, depression and dullness.

The conscious Purusha excites the unconscious Prakriti and in this process upsets the equilibrium of the various gunas. According to Saamkhya there are twenty-five tatvas which arise due to the union of purusha and prakriti. Their union is often described as the ride of a lame man with perfect sight (purusha) on the shoulders of a blind person of sure foot (prakriti). Their process of evolution is as given below and it accounts for the different tatvas.

In Saamkhya creation is the development of the different effects from mulaprakriti and destruction their dissolution into mulaprakriti.

Saamkhya is essentially atheistic because it believes that the existence of god cannot be proved. Prakriti, the cause of evolution of world, does not evolve for itself but for Purusha-the ultimate consciousness. The self is immortal but due to ignorance (avidya) it confuses itself with the body, mind and senses. If avidya is replaced by vidya the self is free from suffering and this state of liberation is called kaivalya. Yoga is the practical side of Saamkhya.

Sanskrit, Samskrtam संस्क्रतम - Sanskrit (संस्क्रतम saṃskṛtam).The adjective saṃskṛta- means "refined, consecrated, sanctified". The language referred to as saṃskṛtā vāk "the refined language" has by definition always been a 'high' language, used for religious and scientific discourse and contrasted with the languages spoken by the people.

Saptarishi, सप्तरिशि -The Ursa Major constellllation. The Saptarishi play a major role in Hindu astronomy A number of yugas In Hindu philosophy, the cycle of creation is divided into four Yugas (ages.): Satya Yuga or Krita Yuga Treta Yuga Dwapara Yuga Kali Yuga make a manvantara Each manvantara has a set of seven rishis who help in preserving order and propagating knowledge in that manavantra.Bharadwaja is one of the seven rishis of the Vaivasvata Manavantra. The other six rishis of the Vaivasvata manavantra are Atri an Hinduism, Atri is a legendary bard and scholar, and a son of Brahma. Jamadagni, is the father of Parashurama, one of the avatars of Vishnu. King Kaartaveerya Arjuna and his army visited Jamadagni, who fed his guest and the whole army with his divine cow; the king demanded the cow and Jamadagni refused because he needed the cow for his religious ceremonies. King Kaartaveerya Arjuna sent his soldiers to take the cow and Parashurama killed the entire army and the king with his axe (given to him by Shiva). In return, the princes beheaded Jamadagni. In revenge, Parashurama destroyes large numbers of the Kshatriyas.

Brahmarishi Viswamitra is one of the seven venerated sages of Hindu mythology. He is a kshatriya (Warrior caste) by birth, but has transcended into the brahmin priestly caste with his tough penance.

Vasishta, in Hindu mythology was chief of the seven venerated sages (or Saptharishi) and the Rajaguru of the Solar Dynasty. He was famous for subduing the armies of Viswamitra. He had in his possession the divine cow Nandini who could grant anything to her owner.

Gauthama and Kashyapa: Kashyapa ("tortoise") is an ancient god (one of the rishis), father of the devas, asuras, nagas and all of humanity. He is married to Aditi, with whom he is the father of Agni and the Adityas. He received the spoils of Parasuma's conquest of King Kaartaveerya Arjuna.

Sapta Saindhava , सप्त सैन्धव – Land of the seven rivers has been generally identified as Punjab by the modern scholars. Rulers of the western lands, the Druhyus and the Anus, preserved the Rig Veda and helped the Puru Bharats in building a Dhaarmic empire

Sattva,**सत्व** - Individuals who are predominantly Sattvic are attached to happiness and to knowledge

Satya,shuddhi - truthfulness in thought and speech

Shaastra or ShAstra or sastra शास्त्र - ShAstra is a Sanskrit word used to denote education/knowledge in a general sense. The word is generally used as a suffix in the context of technical or specialised knowledge in a defined area of practice. For example, Astra shastra means, knowledge about "Handling of weapons", Astra means weapons, and Shastra is their knowledge.Extending this meaning, the shastra is commonly used to mean a treatise or text written in explanation of some idea, especially in matters involving religion. In Buddhism, a shastra is often a

commentary written at a later date to explain an earlier scripture or sutra.In the Indonesian language, 'sastra' is a word meaning 'literature'.

shabda pramaanam (Bhartrihari) See Bhartrihari

Shatapatha Brahmana,शतपथ ब्रःमण

Shatapatha Brahmana (शतपथ ब्राह्मण, Brahmana of one-hundred paths) - is one of the prose texts describing the Vedic ritual. It belongs to the *vājasaneyi madhyandina shakha* of the White Yajurveda. It survives in two recensions, Madhyandina and Kanva, with the former having the eponymous 100 brahmanas in 14 books, and the latter 104 brahmanas in 17 books. Linguistically, it belongs to the Brahmana period of Vedic Sanskrit, dated by Western Indologists to the first half of the 1st millennium BC. Hindu scholars have dated it to around 1800 BC, based on the reference in it of migration from the Sarasvati river area to east India, because the river is said to have dried up around 1900 BC. The 14 books of the Madhyandina recension can be divided into two major parts. The first 9 books have close textual commentaries, often line by line, of the first 18 books, of the corresponding Samhita of the Yajurveda. The following 5 books cover supplementary and ritualistically newer material, besides including the celebrated Brihataaranyaka Upanishad as most of the 14th and last book. The celebrated author of the Shatapatha brahmana is reputed to be **Yajnyavalkya** himself. He is also reputed to have made the observation that the the 95 year synchronization cycle provides an accurate measure of the repeatability of lunar phenomena. The Shatapatha Brahmana was translated into English by Prof. Julius Eggeling, in the late 19th century, in 5 volumes published as part of the Sacred Books of the East series. Retrieved from

"http://en.wikipedia.org/wiki/Shatapatha_Brahmana"

Shakti,शिक्त - the female energy principle, in the Indic tradition ,the primordial icon of strength and energy is associated with the feminine gender

Shaanti - peace of mind attained through the disciplines of Raja Yoga

Shaucha - cleanliness

Sidereal Day - Nakshatra divas, a mean sidereal day is about 23h56m in length. Due to variations in the rotation rate of the Earth, however, the rate of an ideal sidereal clock deviates from any simple multiple of a

Sidereal Month - Sidereal month The actual period of the Moon's orbit as measured in a fixed frame of reference is known as a sidereal month, because it is the time it takes the Moon to return to the same position on the celestial sphere among the fixed stars (Latin: sidus): 27.321 661 days (27 d 7 h 43 min 11.5 s) or about 27 ⅓ days. This type of month has appeared among cultures in the Middle East, India, and China in the following way: they divided the sky in 27 or 28 lunar mansions, characterized by asterisms (apparent groups of stars), one for each day that the Moon follows its track among the stars.

Sidereal Time - During the course of one day, the earth has moved a short distance along its orbit around the sun, and so must rotate a small extra angular distance before the sun reaches its highest point. The stars, however, are so far away that the earth's movement along its orbit makes a generally negligible difference to their apparent direction (see, however parallax), and so they return to their highest point in slightly less than 24 hours. A mean sidereal day is about 23h56m in length. Due to variations in the rotation rate of the Earth, however, the rate of an ideal sidereal clock deviates from any simple multiple of a civil clock.

Sidereal Year - In order for the earth to attain the same position with respect to a fixed star after one revolution, it takes a time span of 365 days 6 hours 9 minutes and some 9.5 seconds. This duration of time is called a sidereal year .The sidereal year is just over 20 minutes longer than the tropical year; this time difference is equivalent to

50.26 seconds of celestial longitude.Each year, the Vernal equinox will fall short by 50.26 seconds along the zodiac reckoned along the fixed stars. It

Smrti,स्म्रति - that which is remembered, . There are a number of texts that are specifically classed as smrti and are mostly named after the name of the rshi expounded on the smrti such as Parashara smrti, Manu smrti and Yajnavalkya smrti

Solar Day - Solar time is measured by the apparent diurnal motion of the sun, and local noon in solar time is defined as the moment when the sun is at its highest point in the sky (exactly due south in the northern hemisphere and due north in the southern hemisphere). The time taken for the sun to return to its highest point is exactly 24 hours, or a solar day.

Sramana tradition - A śramaṇa is one who performs acts of mortification or austerity. According to the definition, a being is himself responsible for his own deeds. Salvation, therefore, can be achieved by anybody irrespective of caste, creed, color or culture. The cycle of rebirth to which every individual is subject is viewed as the cause and substratum of misery. The goal of every person is to evolve a way to escape from the cycle of rebirth, namely by discounting ritual as a means of an emancipation and establishing from the misery of Saṃsāra, through pious religious activities.. The term has been used in the past as a synonym for the Baudhik tradition

Srautasutras - Srauta is the adjectival form of Sruti (that which is heard)and is one of the 4 constituent sutras in the Kalpasutra (see also Sulvasutra)

Sravanam,श्रवणम - Comes from the same root as shruti. Essentially means learning by listening. Sravanam, mananam, nididhyasanam is the 3 step process towards Brahma vidya and self realization**.** In reality it is the approach generally adopted to the study of most subjects especially those with complex concepts

Sruti,श्रुति - that which is heard as opposed to that which is remembered (smrti). The smrti were composed by famous rishis and we have

Sulvasutras,सुल्वसूत्र - The Sulvasutras (or Sulbasutras) or aphorisms of the cord (measurements were made using a string stretched between 2 pegs). The resulting mathematical manipulations needed to solve the problems of finding areas and volumes of reasonably complex shapes formed the subject matter of the Sulvasutras. The Sulvasutras were part of the KalpaSutra appendices to the Veda. KalpaSutra consisted of Grhyasutras, Srautasutras, Dharmasuturas and Sulvasutras. The KalpaSutras in turn are part of the Vedanga (limbs of the Veda) comprising of Chandas (meter), Nirukta(etymology), Vyakarana Grammar, Jyotisha (Astronomy and astrology) and Kalpasutras.0ne set of such Sutras are the Kalpa Sutras which consisted of Srauta Sutras, Dharma Sutras, Grihya Sutras and Sulva Sutras. The Srauta Sutras give elaborate rules for the performance of Vedic sacrifices; the Grihya Sutras deal with domestic religious ceremonies; the Dharmasutras contain the rudiments of Hindu Law and the Sulva Sutras form the earliest source of Hindu Mathematics

Suryaprajnapati - A Jaina astronomical treatise ,which uses a 5 year lunisolar cycle. One of the great contributions of the Jainas to Astronomy and Mathematics in Ancient India. The Jaina tradition exhibited a very superior knowledge of the exact sciences when compared to similar civilizations of that period.

T

Tamas - Tamas is inertia born of ignorance. It enshrouds the discrimination of man and inclines him to indolence, sleep and renders him inert. By nature it is destructive

Tithi/ Lunar Day - The area covered by the Moon in its transit away from the Sun, computed for the moment of its conjunction with Sun to its true longitude at the moment of the epoch. It is obtained by subtracting the Longitude of the Sun from the longitude of the Moon. A tithi is completed when the longitude of Moon gains exactly 12 degrees or its multiple on that of Sun and therefore there are 30 tithis in a lunar month. Is the root of the word atithi which means Guest in sanskritam (meaning one who may show up at any time or day but should be welcomed regardless

http://en.wikipedia.org/wiki/Tithi

Titiksha (Sanskrit) - [from the verbal root *tij* to urge, incite to action, be active in endurance or patience]**.**Patience, resignation, endurance; not mere passive resignation, but an active attitude of patience in supporting the events of life. Mystically, the fifth state of raja yoga -- "one of supreme indifference; submission, if necessary, to what is called 'pleasures and pains for all,' but deriving neither pleasure nor pain from such submission -- in short, the becoming physically, mentally, and morally indifferent and insensible to either pleasure or pain" (VS 93). The meaning however is not of a cold, heartless, impassive attitude towards the sufferings of others, but an active positive attitude, so far as one's individual pleasures or pains are considered, but likewise involving an active attitude of compassion for the tribulations and sufferings of others. The same thought is involved in the title Diamond-heart, given to adepts: as hard and indifferent to one's own sorrows as the diamond is hard and enduring, yet like the diamond reflecting in its facets as in mirrors the sufferings and sorrows of all around.

Also personified as a goddess, the wife of Dharma (divine law) and daughter of Daksha.

Tocharia - A people who lived in the Tarim basin of current day China, and who spoke a Indo European language

U

Upanishads - Of the one hundred and eight extant Upanishads sixteen were recognized by Adi Sankara as authentic and authoritative. In his commentary on the Vedanta Aphorisms he included quotations from six. On the

other ten he wrote elaborate commentaries. It is these ten which...have come to be regarded as the principal Upanishads: Isa, Kena, Katha, Prasna, Mundaka, Mandukya, Chandogya, Brhadaranyaka, Aitareya, and Taittiriya."

Urheimat - A postulate that the Proto Indo European people (another postulate) originally lived in a common homeland or Urheimat at some distant past. While this is a very beguiling assumption, there is absolutely no evidence in Archaeology of such a Urheimat. It is purely a hypothetical construct only of academic interest. See the translations of the passages from the Rg quoted in the section on AIT, in the context of the discussion on the debate of the origin of the Vedic people.

Uttarayana - The Sun's northward journey, as viewed from the earth) from winter solstice (shortest daylight hours) to summer solstice (the longest day in the calendar). Usually celebrated throughout India as Makara Sankranti and Pongal

V

Vaisya - One who benefits humanity by his efforts and specialization in trade, commerce and agriculture. The commercial sector of society.

Varna asrama dharma - The system, namely Guna Varna Vyavastha, that produced the Varnashrama Dharma was conscious of the fact that this was the worlds early attempt at a meritocracy. That the sytem was eminently successful in its own way , I have no doubt because the resulting civilization flourished for well over 5 millennia, until its very foundations were attacked by barbarians from both within and without by Barbarians, whose notion of entertainment was to build a pyramid of skulls, in order to terrorize the local population to capitulate. The current system in place after the colonial power was done reinventing and reshaping it to its own specifications, and which goes by the name Caste, is so utterly different in all significant ways that we can safely say it has little to do with the Hindu faith or Hindu traditions such as the Guna Varna Vyavastha

Vedanga Jyotisha (VJ) , the earliest codified texts of ancient India, and consists of the Rig Jyotisha,(RJ) the Atharva Jyotisha(AJ) and the Yajusa Jyotisha(YJ) . The RJ consists of 36 verses and the YJ consists of 44 verses and the authorship of these two is ascribed to Lagadha

Vedic civilization - the civilization of the people who composed the Vedas and the vast literature of cosmic proportions associated with the SanAtana Dharma

Vedics or the Vedic people - the people who composed the Vedas and their Universe of allies and adversaries

Vedic Saraswati River - The Saraswati river is mentioned in several verses in the Rg at least 50 times as a river flowing from the mountains to the sea. Satellite data has shown evidence of a dried up river bed. Some examples of these quotations are given in the AIT page,http://www.indicethos.org/AIT/. All the AIT and their progeny ignore this significant fact. It is as if the relevance of the reference to the Saraswati is of no significance at all an dif they do dewign to acknowledge the reference to the Sarasvati they claim it is small stream in Afghanistan that never reaches the sea. Reminds one of Oliver Goldsmiths Village Schoolmaster, 'where even though vanquished he could argue still.

Vernal Equinox - see equinox

Vikshepa, kshepa - Celestial latitude , the angle between the celestial equator and the position of the star, measured in the plane of the great circle. This angle is called the declination of the star and is measured in degrees, minutes, and seconds north or south of the celestial equator, analogous to latitude on the earth.

Vishnu,विश्नु - sustainer of the Universe, whose Avatars came down to earth from time to time to reestablish order in the universe.the Srimad Bhaagavatam is a chronicle of the avatars of Vishnu

- uttarayana: period when sun moves north (winter to summer solstice)

Visuva - spring equinox

Visuvant - summer solstice

Vishuvat, विशुवत - Equator

Vivaaha,विवाह - marriage ceremony

Y

Yogasastra, योगशास्त्र - The means to attain Moksha or Self Realization , a knowledge of Metaphysical aspects of the human consciousness

Yuezhi - the Chinese name for the Kushans who invaded India. The conventional date for this invasion is

Yuga,युग - an era of the world

Appendix I

Maps

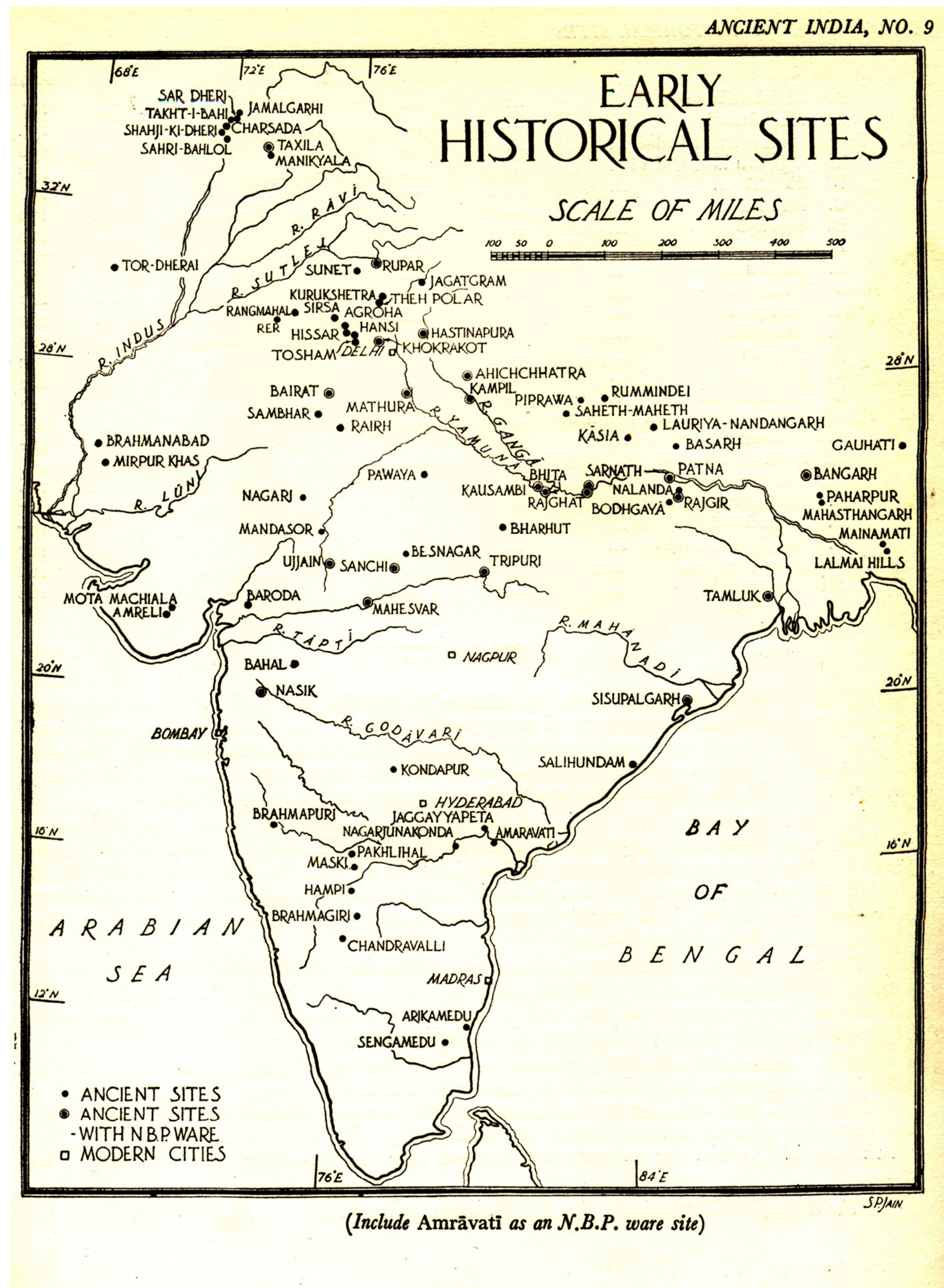


Figure 1 Archaeology Sites ASI

Clearly shows the preponderance of sites along the dried up Sarasvati river

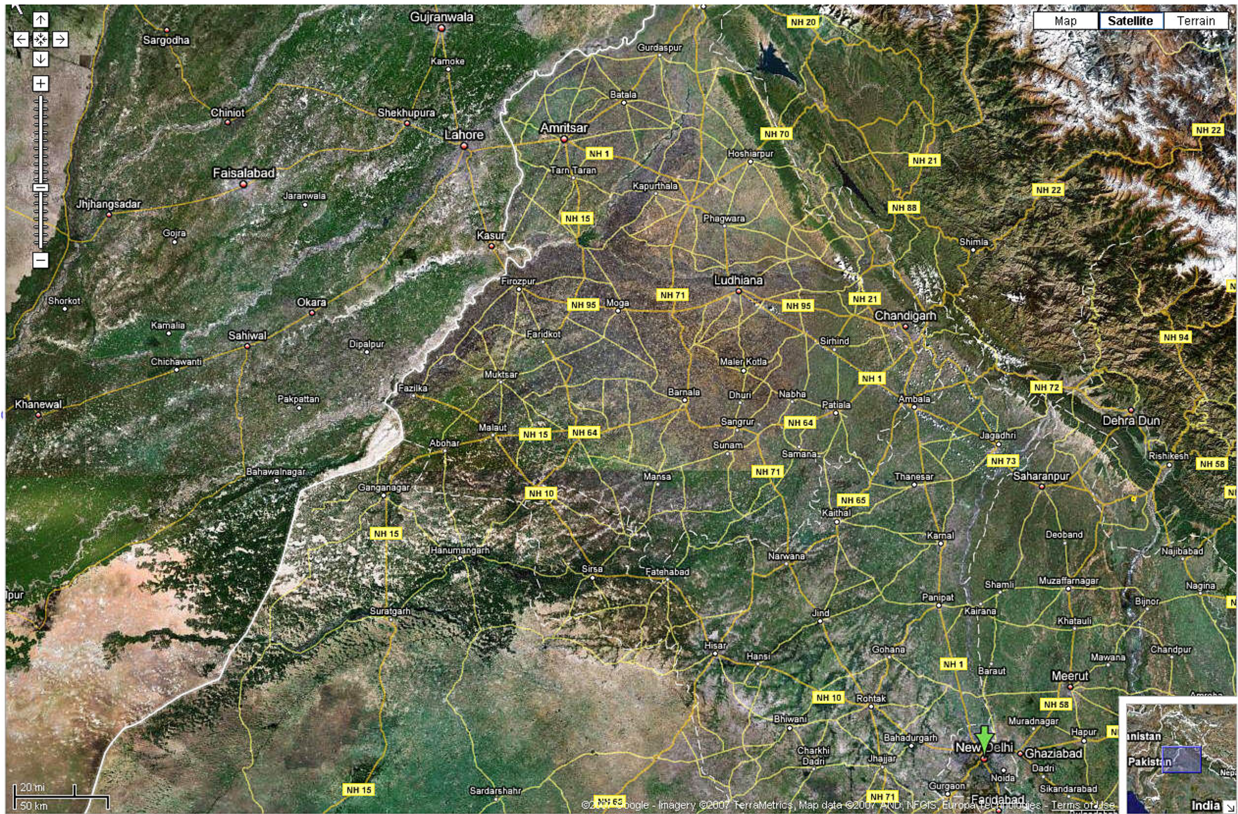


Figure 2 From Google Maps - Region around Delhi, the Sarasvati paleo channel is discernible

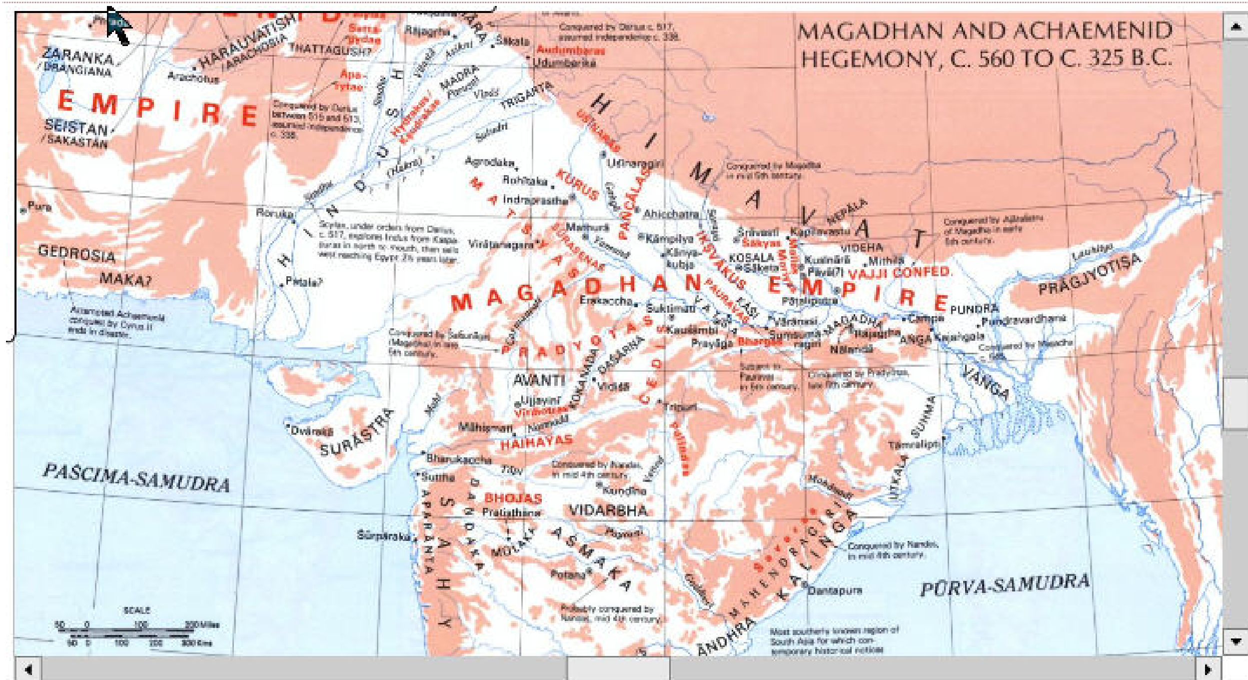


Figure 3 Map of Magadha   (also shows Asmaka, home of Aryabhata)



Figure 4 Map of Asia circa 200 CE (conventional timeline)

(from Wiki)

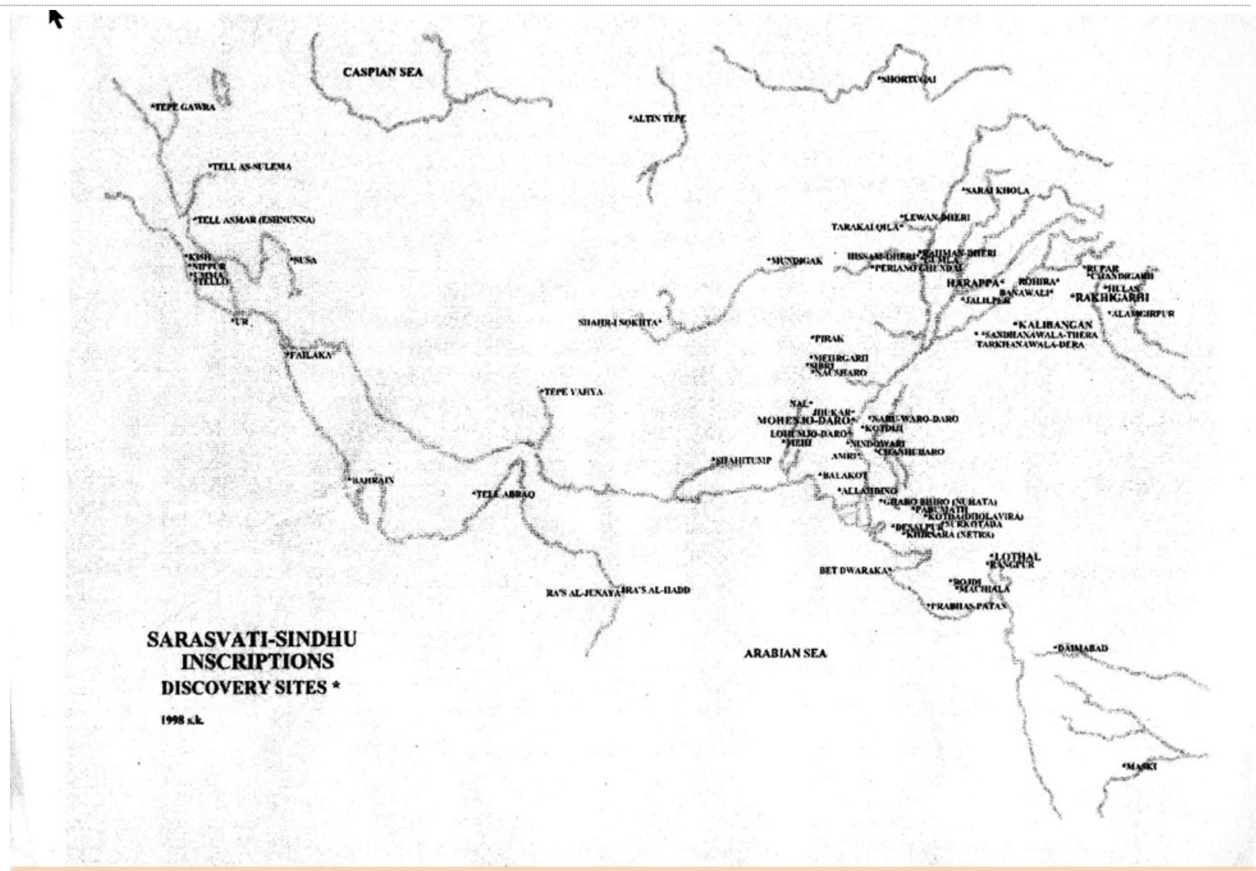


Figure 5 This map shows the newer sites that have been found along the Sarasvati such as Dholavira, Lothal, Rakhigarhi, Kalibangan



Figure 6 Modern Political map of India showing some historical heritage sites



Figure 7 India in 1857

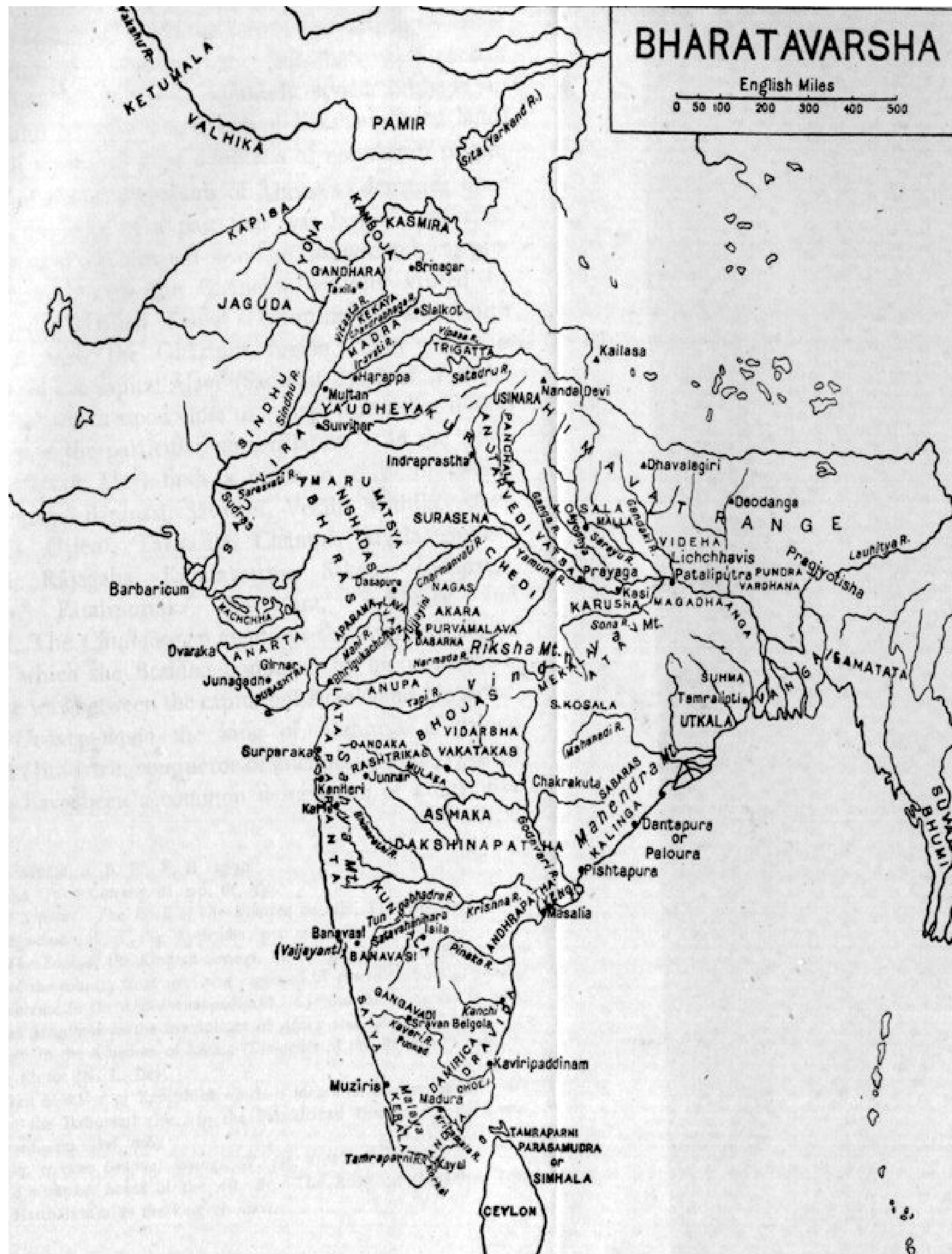


Figure 8 India in 325 BCE



Figure 9 A relief map showing the islands of Ionia. We can see Samos and the city of Miletus

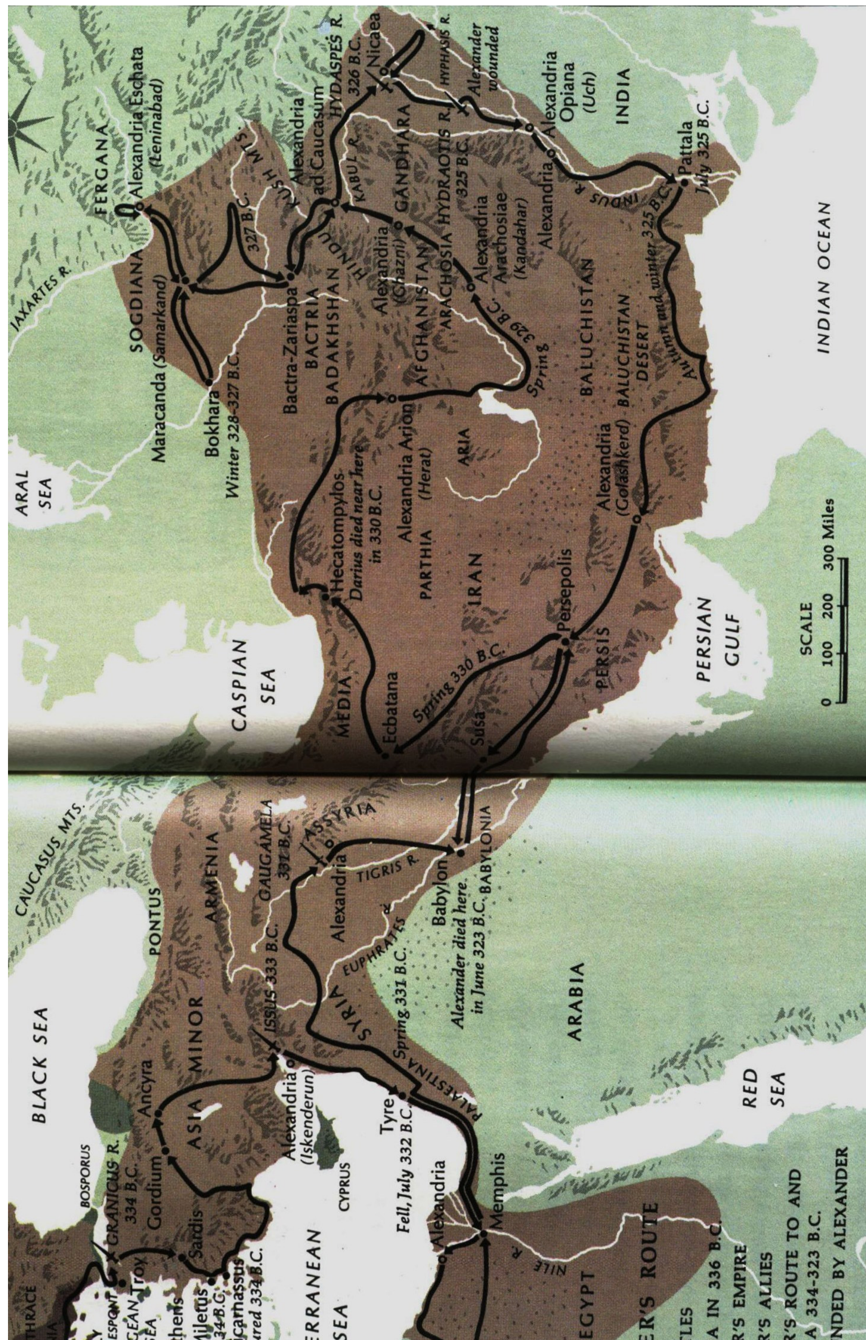


Figure 10 The route of Alexander's invasion Of Asia based on the gleanings of Arrian from primary sources

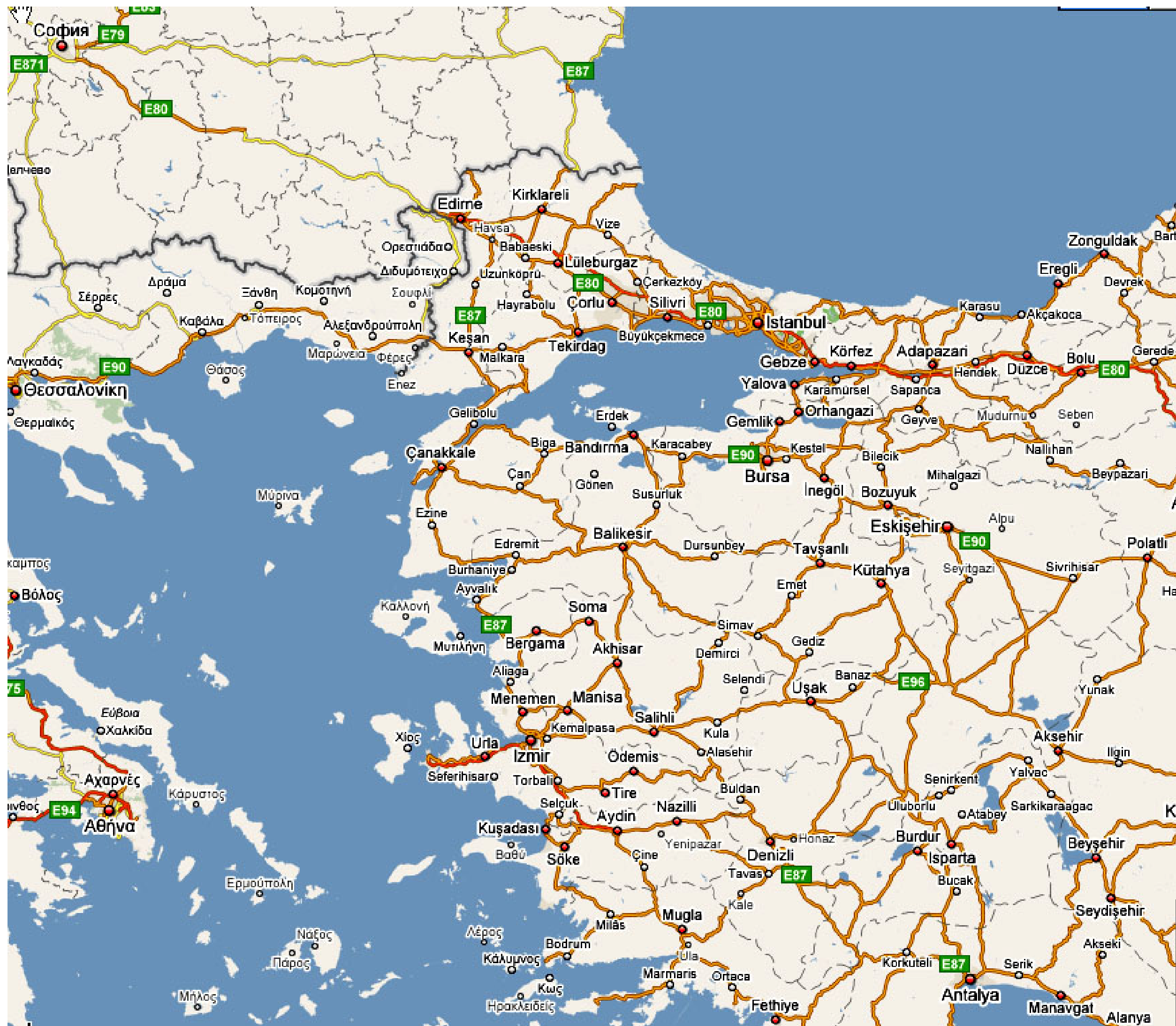


Figure 11 Region of present day Turkey where the Ionian Greeks lived

Appendix J

Demographics of Asian Indian Diaspora

As of January 2008

We included this brief section on the Indic diaspora, to indicate the significant contributions that Indics are making in the global arena. Contrary to the perception that was spread by the colonial overlord that the Indic was not adventurous and that the Indic is allergic to crossing the seas and rarely stirred out of the subcontinent , the facts indicate otherwise, both during antiquity as well as in the recent era. The only period that the Indic did not travel extensively was during the period of Islamic domination and colonial rule. The British went to extraordinary lengths to see to it that the only people travelling in and out of India were themselves and turned the subcontinent into a vast Gulag. The India of antiquity was a major economic force cotnributing to 25% of world GDP and was a massive exporter of goods, ideas, culture and spiritual values

At an estimated 25 million, the Indian diaspora is second in size only to China's 55 million and its combined income is $160 billion, or 35% of India's GDP. Indian expatriates account for 9% of India's FDI.

The strength of the Indian diaspora is not just its financial clout but the role it plays in facilitating ties between the governments of their countries of residence and India. Over the years, as they matured politically, they encouraged and facilitated partnerships between both business and political communities forming a strong bridge between the two sides.

Through the years the image of the Indian Diaspora has changed radically. It is no longer considered as an economically disadvantaged, silent minority in many of the countries. Instead, its contribution to knowledge based industry, especially information technology, has enabled it to mould public opinion to its benefit.

The last two decades have seen the emergence of members of the Indian Diaspora as elected leaders, politicians, eminent professors and businessmen. This trend has coincided with the emergence of India as a global power in science, technology and international politics.

Continent / Country	Articles	Overseas Indian Population
Asia		13,700,000
Nepal		4,000,000[2]
Malaysia	Malaysian Indian, Chitty, Tamil diaspora	2,400,000
Myanmar	Burmese Indians, Myanmar Indian Muslims, Anglo-Indian	2,000,000[3]
Saudi Arabia		1,500,000 [13]
United Arab Emirates		1,300,000 [14]
Sri Lanka	Tamil diaspora	850,000[4]
Oman		450,000 [15]
Singapore	Indian Singaporean, Tamil diaspora	320,000
Kuwait		295,000 [16]
Bahrain		150,000 [17]
Qatar		125,000 [18]
Thailand		65,000
China (PRC, ROC, Hong Kong)	South Asians in Hong Kong	62,300[3][5]
Europe		
	British Asian, Anglo-Indian	1,100,000 [19]
United Kingdom		
Netherlands	Hindoestanen	217,000 [20]

Germany	Indian-Germans	80,000 [21]
France		75,000 [22]
Italy		71,500 [23]
Portugal		70,000 [24]
Spain		29,000 [25]
Russia		16,000[3]
Switzerland		13,500 [26]
Austria		12,000 [27]
Sweden		11,000 [28]
Belgium		7,000 [29]
Greece		7,000 [30]
Norway		6,000 [31]
Ukraine		3,500 [32]
Denmark		2,500 [33]
Republic of Ireland		1,600 [34]
Finland		1,200 [35]
Americas		4,200,000
United States	Indian American, Indo-Caribbean American, South Asian American	2,800,000 [36](Hinduism Today)
Canada	Indo-Canadian, Tamil Canadians	960,000 [37]
Trinidad and Tobago	Indo-Trinidadian, Indo-Caribbean	525,000 [38]
Guyana	Indo-Guyanese, Indo-Caribbean	327,000 [39]

Suriname	Hindoestanen	175,000 [40]
Jamaica	Indo Jamaican, Indo-Caribbean	62,000 [41]
Guadeloupe	Indo-Caribbean	41,000 [42]
Brazil	Asian Latin American	16,900 [43]
Panama	Indo-Caribbean	9,000 [44]
Saint Vincent and the Grenadines	Indo-Caribbean	6,500[6]
St. Lucia	Indo-Caribbean	4,700 [45]
Puerto Rico	Asian Latin American	4,500[6]
Barbados	Indo-Caribbean	2,200[3]
Argentina	Asian Latin American	1,600 [46]
Saint Kitts and Nevis	Indo-Caribbean	1,100[3]
Belize	Indo-Caribbean, Asian Latin American	500[3]
Mexico	Indian Mexicans	400[3]
Africa		2,800,000
South Africa	Indian South Africans, Asians in South Africa	1,300,000 [47]
Mauritius	Indo-Mauritian	855,000 [48]
Réunion	Indo-Réunionnaise	220,000 [49]
Kenya		100,000 [50]
Tanzania		90,000 [51]
Uganda		90,000 [52]

Madagascar		28,000 [53]
Nigeria	Indian Language School1 2	25,000 [54]
Mozambique		21,000 [55]
Libya		20,000 [56]
Zimbabwe		16,000 [57]
Botswana	Indians in Botswana	9,000 [58]
Zambia		6,000 [59]
Seychelles	Indo-Seychellois	5,000 [60]
Ghana		3,800 [61]
Oceania		600,000
Fiji	Indians in Fiji	340,000 [62]
Australia		235,000 [63]
New Zealand	Indo Kiwi	105,000 [64]
Total Overseas Indian Population		24,000,000

Communication from Thomas Abraham, GOPIO this is my take on the Indian community population in America. The 2000 Census showed the Asian Indian population to be 1.8 million. The 2005 interim US Census report showed the population has grown to about 2.4 million. Here the Indo-Caribbean community (people from Trinidad & Tobago, Guyana, Suriname, Jamaica and other islands) is not included. Their numbers in Florida and New York City (Bronx, Brooklyn and Queens) alone reach about 100,000. Indo-Fijians number about 20,000 mainly in the West Coast. The Asian Indian population growth rate per year is about 100,000. Of these numbers, about 60,000 are the new immigrants who get their green cards (professionals, spouses, parents and the old backlog of brothers and sisters of US citizens who applications have been filed 10-15 years ago). In 2005 and 2006, Asian Indian population got the second largest number green cards after Mexicans. Another 40,000 kids are born to our second generation and to the young professionals on temporary visa holders and to graduate students/practical trainees. America brings the child bearing age group of people from India and children are born during their stay here. Some of them go back. However, the kids are American citizens. Projecting from 2005, I estimate the current Asian Indian population to be 2.6 million. Here we are also not including Indians originally from South Africa and Malaysia and

Sri Lankan Tamils, since in the Census form, they generally identify themselves in the other categories and write down their country of origin. If we include all the Indian origin people, the population will likely to reach between 2.7 to 3 million as of 2007.

In terms of the make up of the community, the largest group is Gujaratis followed by Keralites. Just to get feel of the size of the Kerala community, in New York area alone, there are about 60 churches owned by the different denominations of Syrian Christians and about 50 smaller protestant congregations. In the 1980s and 1990s, my estimate was that Punjabis were the third largest group. However, with the large IT professionals coming to America, the Telugus have taken over and I think in the next few years, they will even surpass the Keralites who continue to immigrate as nurses because of the big shortage in America and visas are open in this category. Compared to the population in India, people from UP, Bihar and Orissa constitute the lowest migration. Of course, leaving aside people from Assam, the India's Northeast population in America is very small.

Although I cannot comment with confidence on the religious mix up, I think, the Christian population among the Indian community in America is much higher than other religious communities in proportionate terms back in India. They could be as much as 10% of the Asian Indian population compared to 2% back in India. I think, in comparative terms, the Indian Muslim population in America is much lower than the comparable percentage in India. Making a guess, the Hindu population could be about 80% of the Asian Indian population, i.e. about 2 million people out of 2.6 million.

In terms of sources for these numbers, except for the US Bureau of Census (which have been published in many of the community newspapers), all others numbers come from direct feedback from the community organizations.

Thomas Abraham

Stamford, CT, USA

How Many Hindus Are There In the US? **Hinduism Today, January/February/March 2008 Issue**

Hinduism Today was recently asked to provide a definitive estimate of Hindus in America. Our conclusion: *as of 2008, there are more than 2,290,000 Hindus* in the US. There are no official government statistics on the number of adherents to any particular religion in America, because the US Census does not collect data on religion. Estimates are made mostly by national polls. These are useful for large religious communities, but inaccurate for small ones. For
Hinduism, we believe the soundest approach is based on the number of people in America of Indian origin. A single assumption is then made, that the percentage of Hindus among Americans of Indian origin is the same as the percentage of Hindus in India, 81 percent. One could quibble with this assumption. Some claim--without providing any evidence--that there is a greater percentage of Christians among the immigrants than in India. But with just 2.3% Christians in India, even a doubling of that percentage in America would make only a slight difference.

The US Census Bureau conducts an ongoing statistical study called American Community Survey, which provides yearly updates to the decennial American census. The Survey offers up-to-date information on demographics, housing, society and the economy in America, based on a sample of three million households interviewed each year (out of 105 million). The 2006 Survey, which was released in October, 2007, counted 2,482,141 Asian Indians. This includes those of Indian origin coming from countries such as Trinidad, Kenya, Surinamand Fiji. To update this figure for 2008, we must consider the average annual growth rate for Asian Indians. In the year 2000, the decennial census counted 1,678,765 Asian Indians; the Survey estimated 2,482,141 in 2006, which works out to an annual growth rate of about 6.8 percent. Using that growth rate to extrapolate the 2006 Survey result two years, we calculate 2,831,190 Asian Indians in 2008. Assuming 81% of these Asian Indians are Hindus, just as in India, we conclude that of the 2,831,190 Asian Indians, 2,290,000 are Hindus-- qed! But despite the compelling logic of this analysis, Hinduism Today has never seen it published elsewhere. What about the other estimates? An oft-cited number for Hindus in America--the figure cited on the US Census Bureau website itself--is derived from the American Religious Identification Survey (ARIS) conducted in 2001 by the City University of New York. This was a ephone survey involving 50,281 households. ARIS concluded that 0.4% of America's population, or about 1.2 illion people in 2008, are Hindus. In the absence of a more extensive study, this has become a semi-official number, sustained by the ARISreport's easy availability at the main US Census Bureau website. Before the advent of the American Community Survey, there was no way of challenging ARIS' conclusions. The ARIS report forthrightly acknowledges its limits. It admits, "because the survey depends on telephone interviews, overcoming language barriers has proven prohibitively costly. In effect, this survey has nterviewed only the English-speaking population of the US. In addition, many new immigrants originate in societies and states where responding to personal questions over the telephone is an alien experience, and discussions of one's religious beliefs and identification are deemed to be risky. " The report's conclusion mentions the impressive growth of Hinduism in America, observing, "there are more than three times as any Hindus in the US today as there were in 1990. Undoubtedly, due to the limitations of this study, we have not picked up the full impact of those changes yet." Unfortunately, the ARIS

estimate is typically quoted as fact, with no mention of these caveats. Other figures are based on even less concrete information than the ARIS results. Harvard's Pluralism Project estimates 1,300,000 Hindus, based on the 2004 World Almanac figure of 1,285,000--which, in turn, was based on information from the 1999 Yearbook of

American and Canadian Churches. The Encyclopedia Britannica estimates 1,032,000 Hindus in America by 2000. The World Christian Encyclopedia (1985 edition) projected 700,000 Hindus in 2000, at 0.3% of the population, based on census date from the 1980s. The popular website www.adherents.com uses the ARIS figure, but updates it using growth estimates. All are no more than educated guesses.Many Americans who are not ethnic Indians embrace Hindu practice or belief to one degree or another. Hundreds of thousands have flocked to swamis, pundits, saints and teachers from India since the 1960s. A 2005 Harris poll commissioned by Yoga Journal found that 16.5 million Americans practice yoga regularly. A 2004 Gallup Poll found 72 million Americans--24%--believe in reincarnation, an astonishing number that has held steady for decades and cuts across all religious affiliations, including even 10% of evangelical Christians. There is almost certainly overlap among these groups, but it is reasonable to state that at least a quarter of Americans share significant Hindu beliefs and practices.



(2039 words)

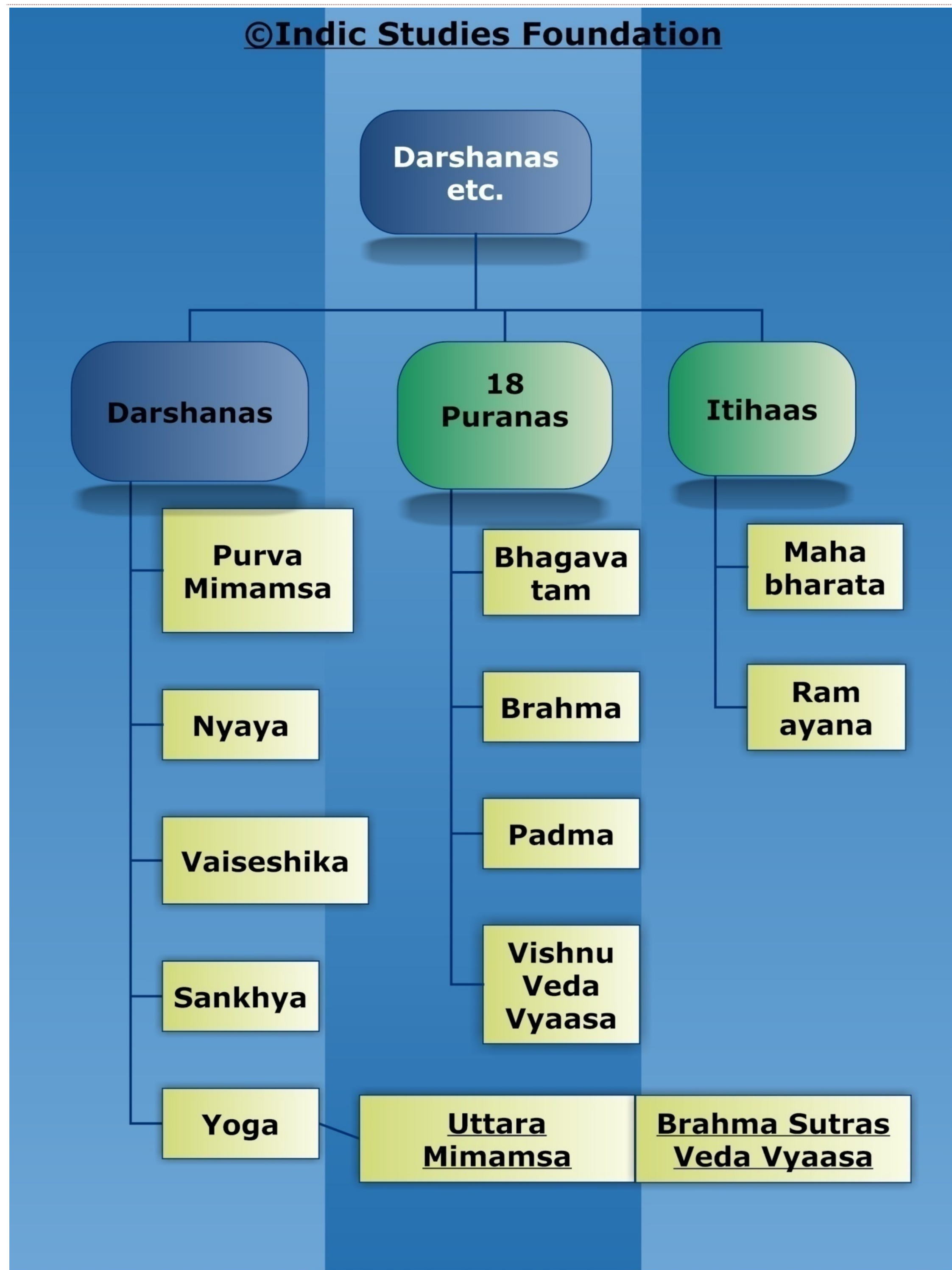
Appendix K

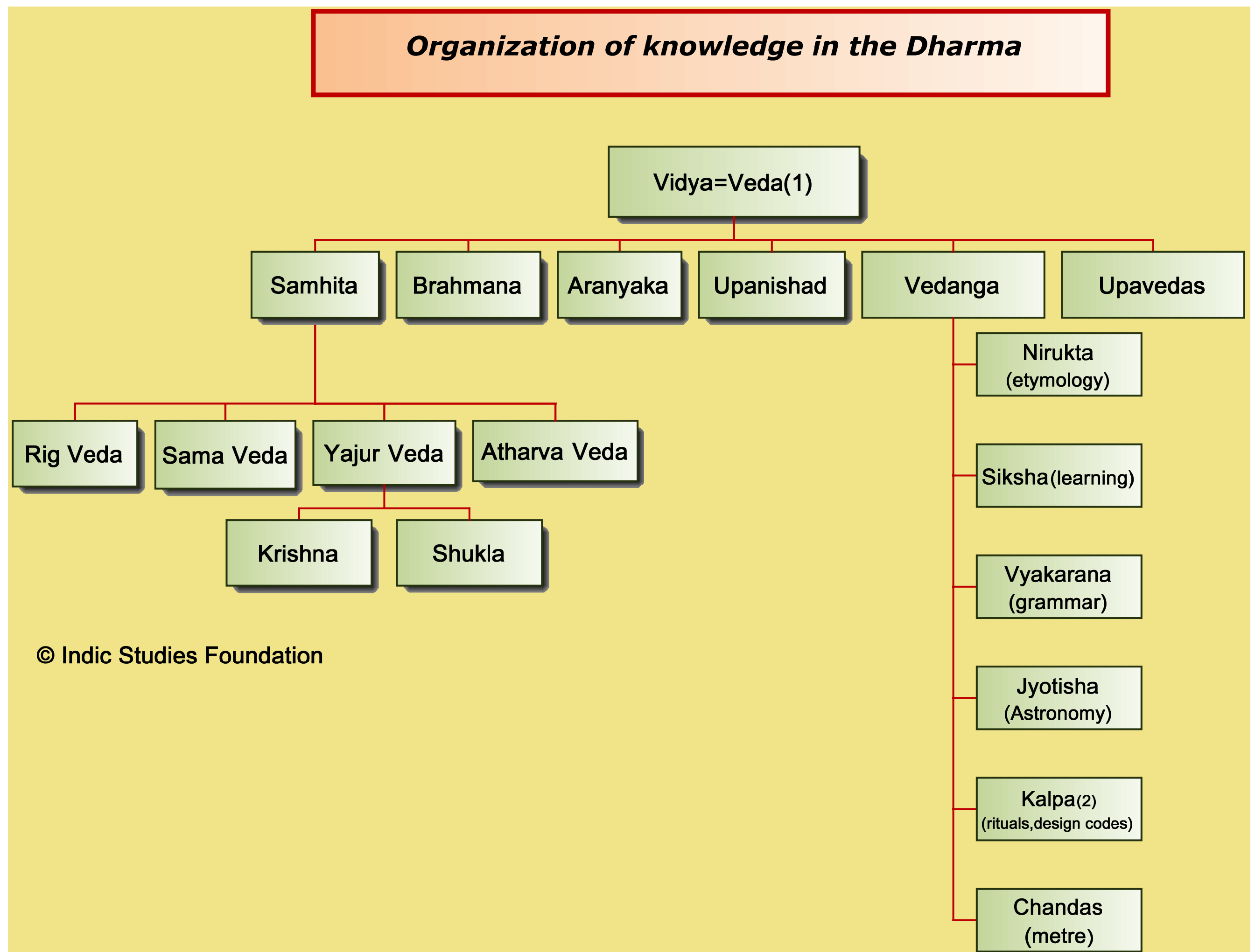
Vedic Epistemology

The Vedic Paradigm for the development of

Apara Vidya (Sciences of the material world)

and Para Vidya (Transcendental Sciences)


©Indic Studies Foundation
Darshanas etc.
Darshanas
18 Puranas
Itihaas
Purva Mimamsa
Nyaya
Vaiseshika
Sankhya
Yoga
Bhagava tam
Brahma
Padma
Vishnu Veda Vyaasa
Maha bharata
Ram ayana
Uttara Mimamsa
Brahma Sutras Veda Vyaasa



Organization of knowledge in the Dharma
Vidya=Veda(1)
Samhita
Brahmana
Aranyaka
Upanishad
Vedanga
Upavedas
Rig Veda
Sama Veda
Yajur Veda
Atharva Veda
Krishna
Shukla
© Indic Studies Foundation
Nirukta (etymology)
Siksha (learning)
Vyakarana (grammar)
Jyotisha (Astronomy)
Kalpa(2) (rituals,design codes)
Chandas (metre)

A glimpse into Traditional Knowledge Gathering in Ancient India

In this section we will focus on the theory of knowledge, not so much on the end goal of jivanmuktiviveka but on one of the paths to such a goal, namely the path of Jnana or Knowledge. What is knowledge ? How do we acquire knowledge ? and if and when acquired how do we know whether the knowledge so acquired is the right knowledge and whether it is relevant to the problems faced by the individual ? Before we begin, we recollect why we invoke shaanti 3 times in order to grant us the wisdom and equanimity to overcome 3 possible obstacles

Adhi Daivika represent Cosmic phenomena such as Meteorites, sun spots which cause a disruption in the planet

Adhi Bhautika encompass Terrestrial phenomena such as fire floods, landslides

Adhyatmika, are purely subjective traits such as inertia, lack of faith, insincerity and such , arise from our own negativities

We will briefly touch on the following topics

Epistemology of the Dhaarmik tradition

(Epistemology is the study of the origin, nature and validity of knowledge).

Darshana **दर्शन** vision, philosophical doctrine

Pramana -**प्रमाण** Right Knowledge

There are several approaches to accumulating and fine tuning knowledge

Pratyaksha**, प्रत्यक्ष,** direct perception, for example ocular proof

Anumaana, **अनुमान ,** inference

Upamaana, उ□मान Use of analogy,simile

Shabdabodha (**शब्दबोध**) Cognition caused by an utterance based on Authoritative or scriptural testimony e,g, The Bhagavad Gita. Who determines whether a particular scripture is authoritative. Ultimately it is the individual.

Arthapaati अर्थपाठि(Postulate)

Upapatti (उपपाठि) Necessity of proof or demonstration

Viparyaya, विपर्यय (Wrong knowledge or lack of discrimination)

Vikalpa विकल्प (Fancy or Verbal delusion)

Nidra (sleep) निद्र

Smriti (Memory) स्म्रति

The Shad-Dharshanas

THE Shad-Dharshanas are six great works (Philosophical systems) that shed light on Indian Ethos, the way the Indic looks at the world, which many mistakenly consider to be based on blind belief. Explaining the *Vedas* explicitly, they share with the world the wisdom contained therein.

The six texts are based on
(a) The *Veda*
(b) Non-belief and
(c) Inner Vision.

They explain incidents and events that pertain to all the three times of past, present and future. They have taught man how to do away with suffering, restlessness etc., and lead a good life by removing the dirt in him. They explicitly state that the *Vedas, the Vedanta* and the knower *of Vedas* are all one and the same. They explain the nature of the mind which is responsible for all Intelligence, intellect and discrimination. These six great *Dharshanas* (texts) are:

(a) *Nyaaya*
(b)Vaisheshika
(c) *Saankhya*
(d) *Yoga*
***(e) Puurva-Mimaamsa* and**
(f) *Utthara Mimaamsa.*

Valid knowledge and its means

Valid knowledge (prama) is defined as that knowledge which has for its object something that is not already known and is uncontradicted (anadhigata-abaadhita-arthavishayaka-jnaanam). The qualification 'something that is not already known' is meant to exclude recollection. The word 'uncontradicted' excludes illusion or error, as when a rope is mistaken for a snake.

The Mimamsakas hold that time is also cognised through the organs of sense. Thus, when an object is seen, the cognition is connected with the moment when it is seen. As a result, when an object is seen continuously for several moments, the cognition at each moment is considered to be different from the cognition of the same object at the previous or next moment. In this view, the cognition at each moment is a new cognition and so the qualification 'something that is not already known' applies and the definition is applicable. According to Vedanta, however, a continuous cognition for several moments is one single cognition. The knowledge of a pot, for example,

is Consciousness reflected in the mental modification (vritti) in the form of the pot and this is just one throughout the time the same pot continues to be seen. In this view also the definition applies.

Objection: According to Advaita Vedanta, all objects such as pot are unreal, being 'mithya', and so the knowledge of the pot is contradicted and it cannot be valid knowledge.

Answer: It is only after the realization of Brahman that the pot is contradicted. In the above definition, 'uncontradicted' means 'not contradicted during the transmigratory state'.

The following is adapted from http://www.dattapeetham.com/

What is Nirvachana (definition)?

For properly understanding a topic, we should be conversant with the correct definitions of the words we useIt was in this context that the question 'what is Nirvachana?' had come up..

Nir-Vachana means, to elucidate appropriately and precisely. It means 'to explain with the help of unambiguous terms what has to be explained'.

In the present context of understanding Vedanta, we were trying to understand the phenomenon of the manifest world and the Knowledge of the Self. Understanding itself is Jnana (knowledge).

Jnana

Jnana is of two types. 1. Yathaartha Jnana and 2. Ayathaartha Jnana.

Yathaartha Janna means understanding an object as that of the literal object only. For example, in the example of rope-snake, to understand a rope to be a rope is Yathaartha Janna.

Wrongly understanding an object (to be something else) is Ayathaartha Janna. This is also called Asatya Jnana (false knowledge). In the analogy of rope and snake, assuming a piece of rope to be a snake is Ayathaartha Janna.

Objection: When simple terms such as Satya Jnana and Asatya Jnana are available, why should difficult words (Yathaartha Jnana and Ayathaartha Jnana) be used?
Reply: It is true that they are difficult terms. But they possess more clarity. There are two words Yatha + Artha (in the word Yathaartha). 'To perceive an object as that very object' is the meaning of these words. That is, to perceive a rope as rope is Yathaartha Jnana. Using the word Yathaartha, rather than Satya conveys this meaning better. Because the term is difficult, the men of wisdom have used another simpler word 'Pramaa' in place of Yathaartha. Pramaa means Yathaartha Jnana.

Pramaa (True knowledge, accuracy of perception)

Pramaa is of two types. 1.Smriti (remembrance) and 2. Anubhava (experience).

Smriti is recollection of what has been experienced in the past. Anubhava is perceiving in the present.

Anubhava comes from Pramanas (testimonies) such as Pratyaksha (direct perception). When the knowledge thus obtained with the help of Pramanas remains in the Antahkarana (inner instruments) as Samskara (latent impression) and after some time, due to some reason gets recollected, it becomes 'Smriti). Therefore, it can be said with certainty that for Smriti to occur, the reason can be anything other than testimonies such as Pratyaksha.

Viewed from this angle, there is clear difference between Anubhava Jnana (knowledge obtained from experience) and Smriti Jnana (knowledge obtained by recollection). The former comes from testimonies such as direct perception etc., while the latter comes from something else. Because of this difference, some argue that Smriti Jnana can not be considered as Pramaa and that only Anubhava Jnana should be considered as Pramaa.

From the above discussion, it is clear that 'to perceive an object as that very object' is Pramaa.

Some scholars have explained this in a different way.

Viphala Pravritti (Viphala=failure, futile, fruitless. Pravritti =attempt)

To perceive a snake where there is only a rope is Ayathaartha Jnana. That is, it is Apramaa. (the opposite of Yathaartha is Ayathaartha; the opposite of Pramaa is Apramaa). How could it be known that this is Ayathaartha Jnana (not true knowledge)? The person who had perceived it as a snake took a club and poked at it. After poking several times, he realised 'this is not a snake; this is only a rope'. In other words, his attempt to find a snake there failed! Here, he faced failure. He was subjected to Viphala Pravritti.

To understand this better, let us consider another example. A person is wandering in the seashore on a sunny afternoon. He is alone. In a distance, he saw a shining piece of silver. Immediately he ran to pick it up. By the time he reached that place, he was gasping for breath. To his disappointment, he found that it was not a piece of silver, but only a seashell. This very seashell, when seen from a distance on a sunny afternoon appeared to him as a piece of silver. At that moment, he was under the impression that it was a Yathaartha Jnana (true knowledge). Therefore, he ran towards it. But when he neared that object, he realised that his effort (to find silver) had failed. That is, he was subjected to Viphala Pravritti. Because of this Viphala Pravritti, he now realised that the knowledge that he had in the beginning was in fact Ayathaartha Jnana.

If he had actually found a piece of silver there, his effort would not have become futile. That is, his Pravritti (attempt) would have been Saphala (fruitful). Then he would have got the confirmation that the knowledge he had in the beginning was Yathaartha Jnana.

Therefore, to confirm whether the knowledge is Yathaartha or Ayathaartha, one should try to procure the object about which the person got the knowledge. If the attempt (Pravritti) becomes successful (Saphala), then it is Yathaartha Jnana. If the attempt becomes futile, it becomes Ayathaartha Jnana.

The above discussion can be condensed as:

'That knowledge which produces Saphala Pravritti is Pramaa; that which produces Viphala Pravritti is Apramaa'.

Thus, two types of definitions have come up for the word Pramaa. 1. To perceive an object to be that very object is Pramaa and, 2. That knowledge which brings about Saphala Pravritti (fruitful attempt) is Pramaa.

Let us now see if Smriti can be considered as Pramaa. In the background of the above two definitions, it must be said that Smriti can be considered as Pramaa. Let us see how. Smriti

shows the past experience as it is now. Therefore, according to the first definition, it can not be anything other than Pramaa.

Let us now see if Smriti can satisfy the second definition. Certain knowledge was obtained by recollecting. For example, the recollection "I was short when I was a boy" came now. With the help of reasoning, it was established that I was indeed short then. Thus, the attempt in this regard was Saphala (fruitful). Therefore, Smriti (recollection) too should be considered as Pramaa.

However, some scholars do not accept these verifications or the above definitions of Pramaa.

It might be true that you have established (with the help of reasoning) that you were a dwarf in your boyhood. But can you take upon yourself that form now? Certainly not! Thus, your Pravritti (attempt) here is not Saphala (fruitful). 'Thus Smriti (recollection) is not Pramaa' is their conclusion.

It is not proper to say that one should always make an effort to confirm the knowledge one gets before accepting it to be true and that only after such confirmation one should accept it as true. For example, dense smoke is visible on a hill. Common sense says that there is forest fire on the hill. Because this knowledge is true, the farmers are taking precautions to prevent their cattle from going in that direction. If it is said that this knowledge is not true, it would mean that every farmer should climb the hill, see the fire there, and then realise that the knowledge that they had got in the beginning was correct. This is impracticable. Therefore, the scholars have given another definition for the word Pramaa: 'The knowledge that is obtained with the help of Pramanas (testimonies) such as Pratyaksha etc., is Pramaa'.

What are Pramanas? How many are they? What is Pratyaksha? What is Pramana? It appears as though this discussion is drawing us very far. In whatever way we define it, the summary is 'Pramaa is that knowledge which produces Yathaartha and that which produces Pramaa is Pramana'.

It means that to know the definition of the word 'Pramana', one should first know the definition of the word 'Pramaa'. In this lesson, two definitions for Pramaa were proposed and subsequently both the definitions were discarded in favour of a third definition. But according to the third definition, Pramana and Pramaa are interdependent. That is, to understand one, the other has to be understood first. It is like saying 'one can not marry unless one is cured of madness and madness can be cured only if one marries'. This is called as Anyonyaashraya Dosha (fault of mutual dependence)

In order to come out of this catch-22 situation, Vedanta proposes a different definition for the word Pramaa.

Definition of Pramaa

The Vedantic science postulates that Pramaa is "that knowledge which has as its subject, an object which has no Baadhaa (contradiction)".

The word Baadhaa generally means distress. However, here the meaning is different.If an object is destroyed along with its Upaadaana Kaarana, then such destruction is called Baadhaa.

Every Karya (result) has many Kaaranas (causes) in the background. For example, if a pot has to result, it requires various causes such as the potter, clay, wheel, the stick that is used to turn the wheel etc.. Even if one of these is not present, the pot can not result. Therefore, for the resultant pot, all these are causes. Among these, it is only the clay that enters the result and stays with it (with the Karya). That cause which enters in to the result is called Upaadaana Kaarana.

Assume that the pot breaks. What is destroyed then is the pot, not the clay. In other words, the result is destroyed, but its Upaadaana Kaarana (material cause) still remains. This phenomenon of the pot ceasing to exist is called Naasha (destruction). Baadhaa is quite different from Naasha.

A person mistakes a rope to be a snake. What happened here? The person knows that some long object is there. However, he does not clearly know what it is. Ignorance (of not knowing the real nature of that object) itself resulted in the form of snake. (We had discussed about this in the 15th and 18th lessons). Therefore, here, snake to result, the ignorance acted as the Upaadaana Kaarana.

When a torch was held near this object, the snake as well as its cause, namely ignorance about the object vanished simultaneously. What truly existed was perceived. Observe here that both the result and its cause vanished simultaneously. This process of vanishing of the Upaadaana Kaarana along with the effect (Karya) is called 'Baadhaa'.

The knowledge of that object which does not have such Baadhaa is termed Pramaa.

To know if the knowledge obtained by us is Pramaa knowledge or not, we must first see if the object we perceive has Baadhaa (hindrance, contradiction) or not.
We saw a pot. The pot may undergo destruction. It can not be subjected to Baadhaa. That is, it can not be annulled. Therefore, its knowledge is Pramaa knowledge. We 'saw' silver in the sea shell. Subsequently, when the knowledge that it is only a seashell dawns, the silver undergoes 'Baadhaa'. In other words, as soon as the reality is known, the silver as well as its cause, namely ignorance, will cease to exist. Therefore, such knowledge is not Pramaa. It is Apramaa.

A person remembered the pot that he had seen the day before. Here, the remembrance may have destruction, but it does not undergo Baadhaa. Therefore, according to the above definition, even Smriti (remembrance) is also Pramaa knowledge.

Even while inferring that there is fire on the mountain (by the sight of the smoke), the fire there does not become subjected to Baadhaa. Therefore, that knowledge is also Pramaa knowledge.

Some scholars thought it prudent not to include Smriti (remembrance) in Pramaa and thought that it should be considered as separate. They modified the definition of

Pramaa slightly as follows:

"That which is not hitherto known and that knowledge which is not subjected to Baadhaa, is called Pramaa".

Although the object that is perceived by remembering does not become subjected to Baadhaa, because the knowledge of that object was there already, it does not become Pramaa knowledge according to the above definition.

Objection: There seems to be some hitch in this definition. A person is continuously and looking at a pot. What happens here? As soon as he sees it, he will get the knowledge –'this is a pot'. Any knowledge remains only for a moment, is it not? Thus, in the second moment, he will get a fresh knowledge – 'this is a pot'. Similarly, he will get the same knowledge again, for the third time and so on. The knowledge - 'this is a pot' which comes in quick successions is called as Dhaaraavaahika Buddhi. (dhaaraa=stream). In this situation, the same knowledge that was acquired in the first instance is acquired in the subsequent instances too. Therefore, the knowledge gained in the second, third, forth etc., instances is something which was already known and therefore, according to your new definition, the knowledge of the pot is not Pramaa knowledge. Do you agree?

Reply: Hold a minute! Your question is based on the assumption that knowledge has momentary existence. Any object or phenomena takes birth only if there is a cause behind it. Also, it will undergo destruction only if there is a cause for destruction. There is no reason or cause for the knowledge (of the pot) to vanish. The knowledge of the pot comes in to being because the Chaitanya reflects in the Vritti (modification) of the Antahkarana (inner instrument). As long as there is no obstruction to that Vritti and till such time that another Vritti takes birth in the Antahkarana, the first Vritti remains unaffected and unaltered. Therefore, there is no such thing as stream of knowledge here.

Objection: In the opinion of Vedanta, is not the entire creation false? Therefore, the parts of the creation (in this context the pot), are also do not have real existence. That is, everything must undergo Baadhaa at one point of time or the other. Thus, the knowledge that the person got when he saw the pot is not Yathaartha Jnaana (true knowledge). In other words, in this world no person can have any knowledge of any object at any point of time. Do you agree?

Reply: All our discussions are taking place in the mundane level. The manifest creation will be subjected to Baadhaa (i.e., the knowledge that the world is unreal will dawn) only after Brahma Saakshaatkaara (realization of Brahman) takes place. Before this, i.e., while we are still in the mundane level, the expression ‘that which does not undergo Baadhaa’ actually means ‘that which, in the mundane level, does not undergo Baadhaa’. It does not apply to the Baadhaa that takes place after the Brahma Jnana is acquired.

By the above discussions, we understood two things very clearly.
1. That knowledge which has as its subject an object that is not subjected to Baadhaa is Pramaa knowledge.
2. That which is not hitherto known, and that knowledge which has as its subject an object which is not subjected to Baadhaa is Pramaa knowledge.

The difference between the two definitions is that, in the first definition Smriti (remembrance) too is considered as Pramaa, whereas in the second definition, Smriti is not considered as Pramaa.
That which is the instrument for such a Pramaa is called Pramaana.

Pramaana

What is Karana? To understand this properly, we should understand the meanings of the words such as Kaarana, Kaaraka and Vyaapaara.

Kaarana: That which is the direct cause of an action, and in the absence of which, that action does not take place, is called as Kaarana.

For example, in the production of pot, there will be in its immediate past, several factors such as clay, wheel, the shaft that turns the wheel, the potter, Kaala (time), Adrishta (the unseen) etc. Even if one of the above is not there, the pot cannot result. Therefore, all these are considered as Kaaranas. Kaaranas are if four types.

1. Saadhaarana Kaarana (common cause)
2. Asaadhaarana Kaarana (special cause)
3. Upaadana Kaarana (explained earlier)
4. Nimitta Kaarana (explained earlier)

In the above set of causes (for the pot), aspects such as Kaala and Adrishta have also been considered as Kaaranas. They are Kaaranas not only for the pot, but also for anything and everything in the manifest universe. Thus, they are called as Saadhaarana Kaarana. (common causes).

All causes other than these two (clay to potter) are causes only for the pot. They cannot be causes for say, a knife or an arrow. Therefore, they are considered as special causes for the pot. Thus, those causes that are specific in producing a result are called as Asaadhaarana Kaaranas.

Among the special causes, it is only the clay that remains even after the effect (that is, the pot) is produced. Such causes are called as Upaadaana Kaaranas. Thus, such a cause, which is present before, during and after the result is produced, is called as

Upaadaana Kaarana.
All Asaadhaarana Kaaranas that are not Upaadaana in nature are referred to as Nimitta Kaaranas.

Kaaraka: Just as the factors behind the effect are called as Kaarana, the factor behind the action is called as Kaaraka. What does 'being behind the action' mean? It refers to that aspect which actually carries out the action. That is, that which is immediately behind the action.

For example, we say 'this axe is cutting the crop'. Here, an action, namely cutting of the crop is taking place. Who is doing that? The axe is doing. Is axe alone doing it? No. There is a hand behind it and there is a man behind that hand. All though all the three take part in the action called cutting, it is the axe that is actually doing the cutting. Such a factor is called as 'Kriyaanirvartaka'.

Vyaapaara: Vyaapaara means transaction. For a result to manifest, many transactions have to take place. For example, for the pot to manifest, several transactions have to take place. The wheel has to turn. Here, the turning of the wheel should also be included in the list of Kaaranas. But, this is present hidden in the Asaadhaarana Kaarana group. It does not have independent existence. That transaction which is dependent on one of the Asaadhaarana Kaaranas and behaves as a cause is called as Vyaapaara.

In the above illustration, the wheel is one of the specific causes for the pot. The transaction called turning is dependent on it. In other words, the turning takes place only in the pot. This transaction of turning also takes part in the production of the pot. Here the transaction called turning is referred to as 'Vyaapaara'.

That transaction which takes birth along from an Asaadhaarana Kaarana, and takes part along with it in the production of the end result (thus acting as a cause itself) is called as Vyaapaara.

Karana: For any Kaarya (effect) to manifest, it is not enough if all the causes are present. In order to produce the result, at least some of them should work or transact. That which carries out the transaction is called the Karana. In the above illustration, the wheel is the Karana.

If this concept can be presented in the form of a definition as follows:In the production of a Kaarya (effect), the cause that transacts is called Karana.All this discussion came up while defining the term Pramaa. It was said that that which is the Karana for Pramaa is Pramaana. That is, among the various specific causes present in producing correct perception, that which has transaction is called Pramaana.

For example, assume that we see a beautiful tree and develop liking for it. Here, both the eyes and the light are the causes for the liking. The light does not do anything. The eye, on the other hand, does the transaction called seeing. Therefore, for the liking the eyes serve as the Karanas. Therefore, the eyes are considered as Pramaana.

How many Pramaanas are there? Different scholars have given different opinions. Let us discuss about them later.

Pramanas – their number

Different scholars have given different opinions about the number of the essential pramanas. Charvakas, (the atheists) have declared that there is only one Pramaana and that is Pratyaksha.

Bouddhists and the scholars belonging to Kanaada school of thought include Anumaana also and say that Pramanas are two in number. Anumaana is inference. It is not proper to think that everything in this world can be understood by Pratyaksha (direct perception) alone. Inference done with due caution also worthy of believing. Therefore Anumaana is also a Pramaana – opine these scholars.

The proponents of Saankhya school of thought say that along with Pratyaksha and Anumaana, Shabda is also a Pramaana. Shade means words of an intimate and trustworthy person. It is not enough to limit ourselves to direct perception or inference. We should believe the words of men of wisdom – this is the idea of the Saankhyas. The Vedas are the most superior in this category. Therefore, the Vedas are referred to as. They are also called as Agama.

The scholars belonging to Tarka (logic) school of thought say that along with Pratyaksha, Anumaana and, even Upamaana (simile) should also be considered as a Pramaana. Upamaana is similarity. For example, we showed a flying animal to a person and told him that it was a crow. After sometime, a similar looking animal came there, this person can easily say that it is also a crow. From where did he get this knowledge? He got this knowledge by comparing this object with the one he had seen earlier. Because Upamaana helps in knowing an object, it should also be considered as a Pramaana – is the opinion of the logicians.

The scholars of Meemaamsa Shastra (particularly the Praabhaakara school) include Arthaapatti along with the above four. Arthapatti is postulation. It is described as the necessary supposition of an unperceived fact that demands an explanation. For example, if a person is fasting during the day and yet is growing fat, we are forced to conclude that he is eating at night. Such postulation is Arthapatti. In simple language, Arthapatti means that which easily becomes evident.

This is not mere imagination. Here there is a clear understanding that in the absence of a particular act, what has become evident could not have happened at all. We see many such examples in life. Therefore Arthapatti should also be considered as a Pramaana is the opinion of the Meemaamsa scholars.

Another school pertaining to Meemaamsa Shastra, the Bhaatta school opines that along with the above five (Pratyaksha, Anumaana, Upamaana and Arthapatti), another Pramaana, namely Anupalabdhi should also be included. The knowledge that a particular object is not present (here) is Anupalabdhi. If there is a tree before us, we will perceive it. For this, the eyes serve as Pramaana. If there is nothing before us, the eyes do not say 'there is no tree here', 'there is no jar here', 'there is no rock here' and so on.

Therefore, there is a Pramaana that tells us about the non-existence of objects. It is called Anupalabdhi. When we do not perceive a pot on a table before us, we come to know that it does not exist. Thus, it is a negative means of knowledge.

The Pouranikas (mythologists) suggest that two more Pramanas, namely, Sambhava and Aitihya should also be considered along with the above six Pramanas.

Sambhava means educated guess. For example, when we take a vessel to an experienced cook, he can say with certainty that a particular amout of rice can be cooked in that vessel. That which brings about such knowledge is called as

Sambhava Pramaana.

Aitihya means traditional instruction that has been handed down though generations. Mythologists say that even this should be considered as a Pramaana.
The Vedantists have thoroughly examined all the above Pramanas and have declared that Pramanas are six in number. According to Vedanta, Pratyaksha, Anumaana, Upamaana, Agama, Arthapatti and Anupalabdhi are the six accepted Pramanas. Therefore Vedantists are also referred to as Shat-Pramaana-Vaadins. (Shat=six, Pramaana=evidence, Vaadi=proponent)
Let us try to understand the six Pramaanas with the help of definitions.

Nyaaya Dharshana forms the life for other *dharshanas*

it is also called *Gautama Shaasthra.* This forms the life for the remaining five *Dharshanas.* We have measures to judge the quantity and volume of material in the world. Even in respect of Divinity, a measure must be available by which the proof may be obtained. *Vedas* speak of four kinds of proofs. They are
(1) *Pratyaksha* (direct perception),
(2) *Anumaana* (inference),
(3) *Upamaana* (comparison)and
(4) *Shabdha* (sound).

Prathyaksha pramaana: This is called direct proof, as it is perceived by the sense organs. These organs are only instruments. The mind enters them and helps them to function. There are some limitations on the senses like disease and imperfection, that make proof obtained by this method to be infirm. For example, a normal eye can see all colors, a jaundiced eye sees everything as yellow. Though the *laddu* is sweet, the tongue of a malaria patient classifies it as bitter. Here, there are two points of view. From the point of view of the matter it is sweet. But from the point of view of the senses it is bitter. It can be concluded, therefore, direct proof is not complete evidence for real justice.

Inference

Anumaana pramaana: This is based on doubt and inference. One sees cranes in the distance, for example, and infers that water Could be available there. Similarly, one infers about fire by seeing the smoke, from the *Svabhaava* (natural traits), one. makes out about the *Svaruupa* (the real form).

Inference or **anumaana** is defined as that cognition which presupposes some other cognition. It is knowledge which arises (anu) after another knowledge. It is mediate and indirect and arises through a mark, linga or hetu (middle term) which is invariably connected with the saadhya (the major term). Invariable concomitance (vyaapti) is the nerve of inference. The presence of the linga in the paksha (minor term) is called pakshadharmataa. The invariable association of the linga with the saadhya is called vyaapti.

According to Nyaya, anumaana (inference) is the efficient instrument (karana) of inferential knowledge (anumiti). Anumiti is knowledge that arises from paraamarsa. Paraamarsa is a complex cognition which arises from a combination of the knowledge of invariable concomitance (vyaaptijnaana) and that of the presence of the linga in the paksha -- technically known as pakshadharmataajnaana.

Upamaana pramaana: This kind of testimony is based on comparison. It enables us to understand many things that cannot be otherwise easily understood, by comparing them to some others that can be. By studying the *Praathibhasika* (apparent reality) and the *Vyaavahaarika* (empirical reality), one can infer about *the Paaramaarthika* (transcendental). For example, by studying the foam (empirical reality) that originates from the waves (apparent reality), one can understand the reality of the Ocean (transcendental reality). This is possible because both the foam and the waves originate from the Ocean, and mirror its character in them. This is the example cited for all beings emanating from the Ocean of Divinity as waves.

***Shabdha pramaana* is the ultimate proof**

Shabdha pramaana: It is the proof garnered on the basis of sound. It is considered to be the ultimate proof. It is based on the testimony of the sound that the *Vedas, Vedaangas, Upanishaths* and the Bhagavath Geetha came into existence, But, to be able to perceive this testimony, one must be properly attuned and extremely careful. It needs one to travel beyond the mind and the senses. At this stage of *Samaana chittha* (mental equanimity), sound becomes the very form of God. The eight forms of God are *Shabdha Brahma mayee* (sound), *Charaachara mayee* (All pervasiveness), *Paraathpara mayee* (Transcendental nature), *Vaang mayee* (speech), *Nithyaanandha mayee* (blissful), *Jyothir mayee* (Effulgence), *Maaya mayee* (illusion) and *Shreemayee* (prosperity).



(5311 words)

Appendix L

Table14 Index of Indic Savants in the computational sciences from antiquity

Name Details

Apastambha, author of Sulva Sutra, circa 2000 BCE
Aryabhata Ia (author of Aryabhata Siddhanta)
Aryabhata Ib (author of Aryabhattiyum of Kusumapura)
A 1b = or not = A 1a
Aryabhata II (author of Mahasiddhanta,950 CE)
Bakshali Manuscript
Baudhayana, author of Sulva Sutra, circa 2000 BCE
Bhadrabahu
Bhartrihari, considered to be the father of semantics
Bhaskara I (629 CE of Vallabhi country)
Bhaskara II (Bhaskaracharya son of Maheshwara)
Bhattotpala of Kashmir (966 CE)
Bhutivesnu son of Devaraja, circa 14th century CE ?
Bose
Brahmadeva son of Chandrabuddha 1092 ce
Brahmagupta son of Jisnugupta
Chandrasekhara Simha or Chandrasekhar Samanta (are they the same – yes)) 1835 CE
The Daivajna Family –
The Bernoullis of India
anesha Daivajna I (1505 CE son of Lakshmi and Kesava))
Kesava Daivajna
Krishna Daivajna
Visvanatha Daivajna (son of Divakara Daivajna) 1578 CE
Vishnu Daivajnya (son of Divakara Daivajnya) same as Visvanatha ?
Narasimha Daivajna (son of Krishna Daivajnya) 1586 CE
Rama Daivajnya , sonn of Madhusudhana Daivajnya
Kamalakara , son of Narasimha Daivajnya ? , 1616 CE
Ranganatha son of Narasimha Daivajnya (1643 CE)
Lakshmidasa Daivajna
Ganesha Daivajnya II (great grandson of Ganesha Daivajnya I (1600 CE)
Nagesh Daivajnya (son of Shiva Daivajnya) (1619 CE)
Damodara, son of Parameswara and guru of Nilakantha Somasutvan also referred to as son of Padmanabha (1417 CE) are they one and the same
Deva (Deva Acharya)
Dasaballa (son of Vairochana) 1055 CE
Gangadhara
Gaargeya
Ghatigopa

Govinda Bhatta
Govindasvami
Harish Chandra
Haridatta (circa 850 CE)
Hemchandra
Jagannatha Pandit
Jyesthadeva of Kerala (circa 1500 CE ?)
Madhava of Sangramagama in Kerala (1340 to 1425 CE
Maharajah Sawai Jai Singh
Mahavira , founder of Jainism, author of Surya prajnapati and Chandraprajnapati, ? 5th century BCE
Malikarjuna Suri , 1178 CE, name suggest Telugu country
Mahendra Suri, pupil of Madana Suri , (1370 CE)
Kamalakara (1616) alt.1610 CE, son of narasimha (belongs to Daivjnya family ?
Katyayana , Author of Sulva Sutras
Kodandarama (1807-1893) of the Telugu country alternate (1854CE) son of Venkatakrishna Sastri (source , sourcebook KVS)
Krisnadesa
Kumararajiva
Lagadha
Lakshmidasa , son of Vachaspati Misra
Lalla son of Bhatta Trivikrama
Latadeva , pupil of Aryabhata Ib
okavibhaga (Jaina text)
Madhava (son of Virupaksha of the Telugu country)
Mahadeva (son of Bandhuka)
Mahadeva son of parasurama ,
Mahavira (founder of Jainism)
Malayagiri, Jain Monk from Gujarat
Mallikarjuna Suri
Mahavira of the Digambara sect
Mahendra Suri (1349 CE)
Manava
Narayana
Nilakantha Somayaji or Nilakantha Somasutvan (1444 CE to 1550 CE) of Trikkantiyur
Nisanku
Padmanabha son of Narmada (same as Parameswara ?)
Pandurangaswami
Panini
Paramesvara (1360-1455 CE) alt.1380 – 1460 CE,a Namputiri of Vataserri in Kerala
Patodi
Pingala
Pillai
Prabhakara (pupil of Aryabhata I, 525 CE ?
Prthudakasvami Chaturveda
Putumuna Somayaji (18th century CE)
Raghunath Raj
Rajagopal
Ramanujam
Ramanujan

Sankara Variyar (1500 – 1600 CE) pupil of Jyeshtadeva
Saamanta Chandrasekhar Simha (see also Chandrasekhar Sinha)
Somaswara circa 11 century CE
Sridharacharya
Sripati (son of Nagadeva, 999 CE)
Suryadeva Yajwan (1191 CE of Gangaikonda Cholapuram in Tamilnadu)
Varahamihira (son of Adityadasa)
Virupaksha Suri of the Telugu country
Venkatesh Ketkar
Vijayanandi
Virasena Acharya
Yaajnavalkya
Yallaiya (1482 CE of Skandasomeswara of the Telugu country)
Yaska
Yativrsabha
Yatavrisham Acharya
Yavanesvara



(534 words)

Appendix M Index of Authors

Kosla Vepa Session Chair
Narahari Achar
Vijay Ashar
Anirban Banerjee
Michel Danino
Stephen Knapp
OmPrakash Misra
Viswanath Swaroop Misra
Jagat Motwani
Suvarna Nalapat
Muralidhar Pahoja
M A Narasimhan
Oleg Parzeshkevich
Jayashree Anandam Pillai
Vamadev Shastri (aka David Frawley)
Joginder Singh
Yellapragada Sudershan Rao
Swami Vigyanananda

(50 words)



Appendix N Pictorial Vignettes



Figure 1 Asoka's edict in Brahmi script

Facing page

Figure 2 The Bakshali Manuscript

one of the first instances of the use of a decimal place value system, circa 200 ~500 CE

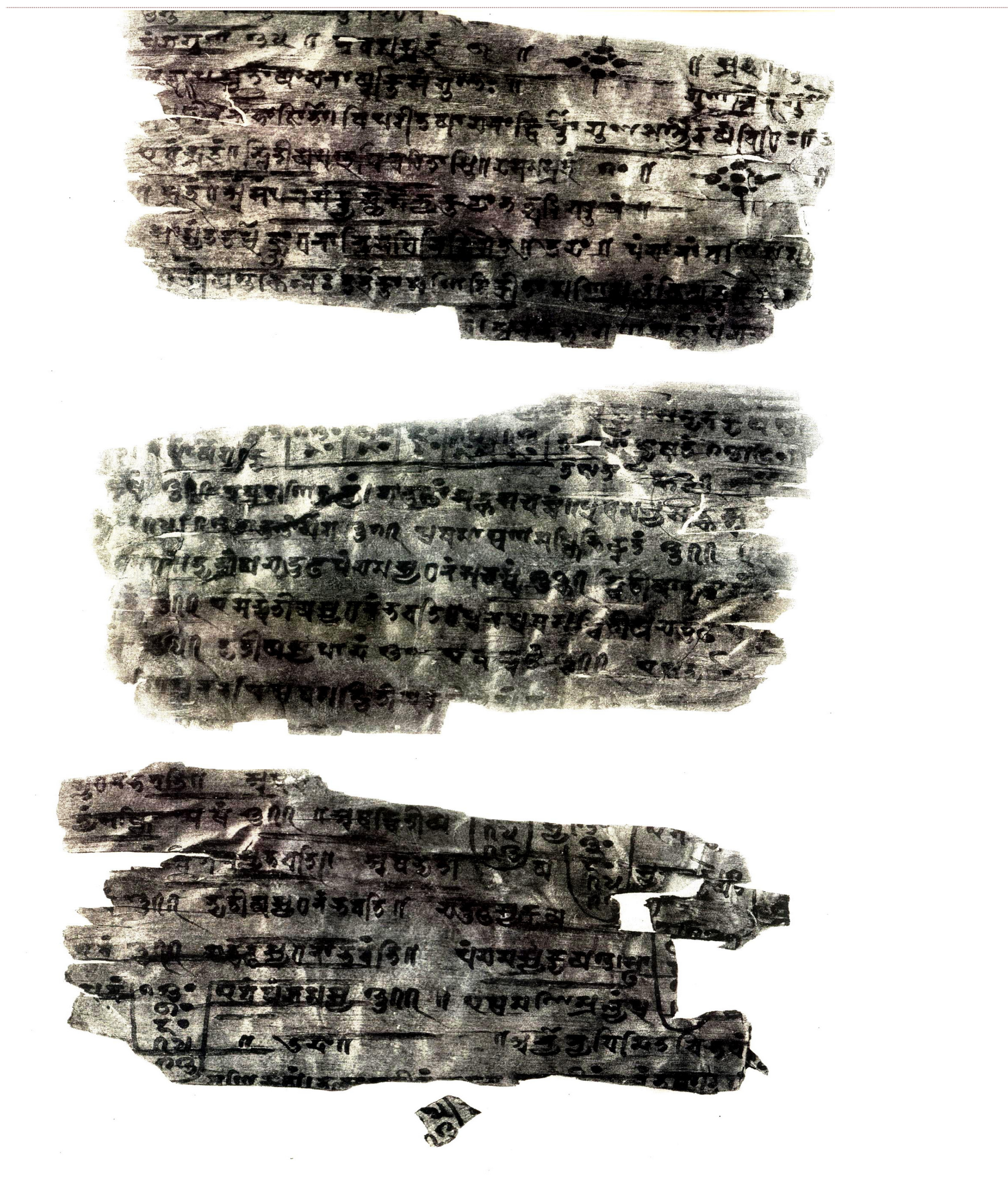




Figure 3 Alexander Burnes was the first Englishman to notice the Indus Valley ruins at Harappa.



Figure 4 The picture of famine 1877

In a land laced with numerous rivers and noted for its agricultural bounty, famine was a rare occurrence in India till late into the medieval era, and was usually the consequence of a major natural or manmade catastrophies. All that changed after the British conquered the territories of the sub continent . The frequency of famine was especially high in areas directly administered by the British. There were many great famines where millions died, and famine occurred with dreadful regularity after the British Crown assumed the overlordship of the subcontinent . The present picture of India as a land bedeviled with extreme poverty is a direct legacy of the massive incompetence of the British in their stewardship of the subcontinent. The British destroyed the dignity of the vast portions orf the population and reduced them to a undernourished and poverty stricken populace, where almost 90% of the population was under the grim levels of poverty. The pathetic strory of the inhumanity of the colonial overlord is chronicled by Davis[133] . **The estimate of total killed in all the famines during British rule is approximately 50 million. When coupled with the 70 million killed during the era of Islamic domination of the subcontinent, one wonders how the Hindu, who formed the bulk of the rural population survived at all.**

1770: territory ruled by the British East India Company experienced the first Bengal famine of 1770. An estimated 10 million people died.
1780-1790s: millions died of famine in Bengal, Benares, Jammu, Bombay and Madras.
1800-1825: 1 million Indians died of famine
1850-1875: 5 millions died of famine in Bengal, Orissa, Rajastan and Bihar
1875-1902: 26 million Indians died of famine (between 1876-1878 alone 10 million died of starvation)
1905-1906: famine raged in areas with the population of 3,3 million.
1906-1907: famine captured areas with the population of 13 million
1907-1908: famine captured areas populated by 49,6 million Indians.
In 1943, India experienced the second Bengal famine of 1943. Over 3 million people died.

[133] Davis, Mike.,"Late Victorian Holocausts", Verso, 2002

Table 15 Incidence of Famines in India

1770: territory ruled by the British East India Company experienced the first Bengal famine of 1770. An estimated 10 million people died.
1780-1790s: millions died of famine in Bengal, Benares, Jammu, Bombay and Madras.
1800-1825: 1 million Indians died of famine
1850-1875: 5 millions died of famine in Bengal, Orissa, Rajastan and Bihar
1875-1902: 26 million Indians died of famine (between 1876-1878 alone 10 million died of starvation)
1905-1906: famine raged in areas with the population of 3,3 million.
1906-1907: famine captured areas with the population of 13 million
1907-1908: famine captured areas populated by 49,6 million Indians.
In 1943, India experienced the second Bengal famine of 1943. Over 3 million people died.

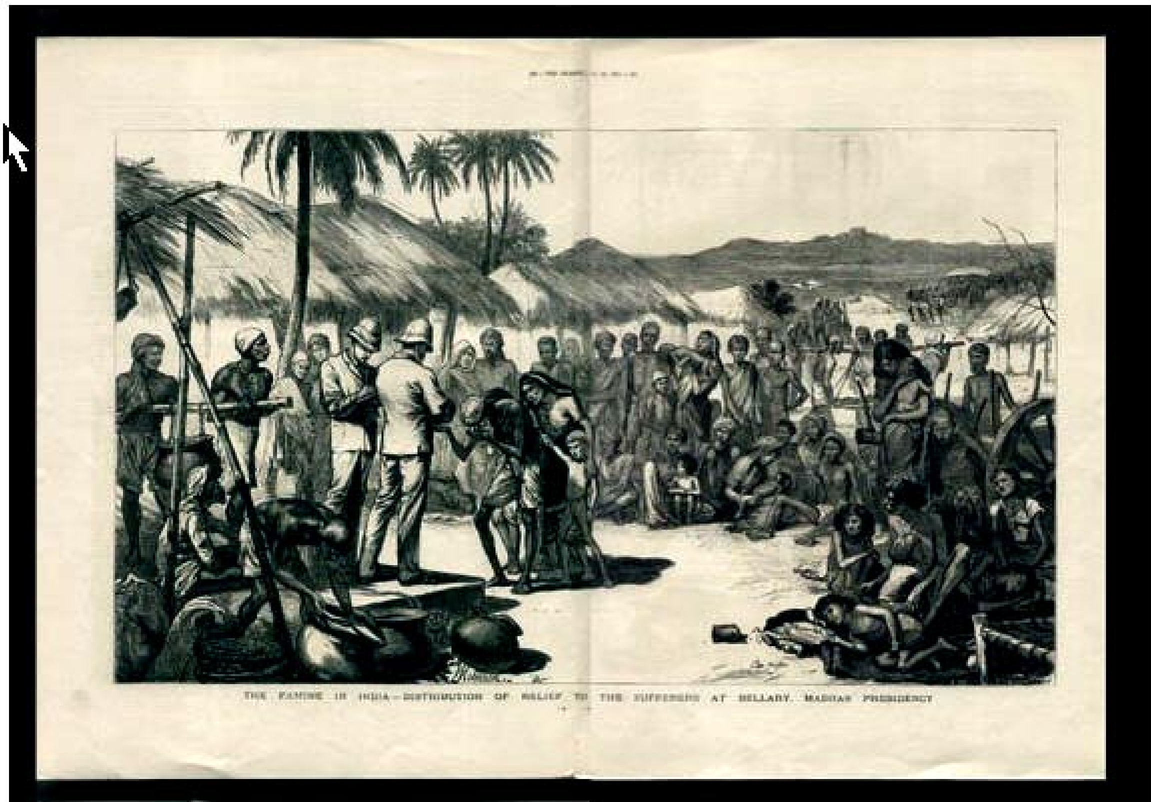


Figure 5 The famine in India - the sufferers at Bellary, Madras Presidency. October 20, 1877.

10 million died in this famine in India. This is the same region of India where once the famed and opulent Vijayanagar Empire ruled a vast area of South India for over 200 years.

Some British citizens such as William Digby agitated for policy reforms and famine relief, but Lord Lytton, the governing British viceroy in India, opposed such changes in the belief that they would stimulate shirking by Indian workers. Reacting against calls for relief during the 1877-79 famine, Lytton replied, "**Let the British public foot the bill for its 'cheap sentiment,' if it wished to save life at a cost that would bankrupt India," substantively ordering "there is to be no interference of any kind on the part of Government with the object of reducing the price of food," and instructing district officers to "discourage relief works in every possible way.... Mere distress is not a**

sufficient reason for opening a relief work." (quoted in Davis 2001:31, 52)

It is rare to see any censure of Lord Lytton, the Viceroy by traditional British historians like Sir Penderel Moon, but clearly his callousness towards the extinction of human life by slow starvation especially if it was Indian ,even on such a massive scale, bordered on the bestial.

The Famine Commission of 1880 observed that each province in British India, including Burma, had a surplus of foodgrains, and the annual surplus amounted to 5.16 million tons (Bhatia, 1970). At that time, annual export of rice and other grains from India was approximately one million tons. At about the same time the British devised the first ever famine scales and engaged themselves in a series of canal building and irrigation improvements. The results were that the mortality rate decreased rapidly. There was the threat of famine but after 1902 there was no major famine in India until 1943. In 1907 and in 1874 the response from the British was better: in both cases rice was imported from abroad and famine was averted.

One of the forgotten stories of yesteryear is that of the ubiquitous occurrence of Famines during British rule in the Indian subcontinent. Our primary focus remains the accurate portrayal of the Indic civilization. However there are reasons why we do not wish to gloss over the holocausts that took place during British rule and during the 500 years of Islamic domination of the Indian subcontinent. As the quote by Will Durant aptly encapsulates, there is only so much abuse that a civilization will take before there is mortal damage to the ethos of the civilization and the psyche of the survivors. Our purpose here remains one of reaching an understanding of the durability and resilience of the Indic civilization, but at the same time one must have an accurate description of the massive damage inflicted on this civilization during the last 800 years. No Indian should forget the horrors of the destruction and genocide wrought by Tamer Lang in Delhi in 1398 CE, the consistent enslavement of the Indic population over several centuries, the naming of an entire mountain range in Afghanistan for what it signified, the death of millions of slaves as they were carried away to the slave markets of Samarqand, Damascus, Isfahan and Bokhara, the great Bengal famine of 1769, which initiated a whole cycle of famines in India over a 180 year period , culminating in the Great Bengal Famine of 1943, the rapacity of Warren Hastings and Robert Clive and the subsequent enrichment of the British landed gentry , resulting in the English countryside being dotted with mansions dating from 1770 onwards. There has been no apology forthcoming. It is perhaps audacious of the children of a lesser God to expect such apologies, but surely it is important, the British public should not remain blissfully oblivious of the pernicious and penurious effects of their sustained impoverishment of India. The holocaust under British rule was of a lesser magnitude than the Holocaust under Islamic domination but the rate at which human beings were killed each century was significantly higher during the British Raj if we include all man made causes such as famines.

We reiterate once again the reasons for reliving the past; it is mainly to learn the right lessons and to undertake actions and measures to avoid a repetition of the past. It is often asserted that we should not dwell on the past , since it would unnecessarily hurt the sentiments of our fellow Indian Muslims of today , who had little to do with the happenings of the past. To this we say, that a little bit of hurt sentiment never hurt anyone, and it would be more horrifying if we were to find out that there was no hurt sentiment at all. Certainly to speak of hurt sentiments in the same breath as they glorify the Muslim conquest of India signifies a cognitive dissonance which deserves an explanation and we feel there are the beginnings of thoughtful Indian Muslims who take the same view of our history as we do as exemplified by Dr. Abdul Kalam ,the current President of India

We begin by linking two articles one, from an address by Dr. Babu Suseelan in a symposium on the Roots of Terrorism, and another by Dr. Gideon Polya on the Great Famines of India. The links are to be found in our new section on Holocausts and Famines in India

Figure 6 The Famine of 1877 People dying of starvation. Altogether around 26 million people died between 1876 and 1906 during the 'benign' colonialism of the British

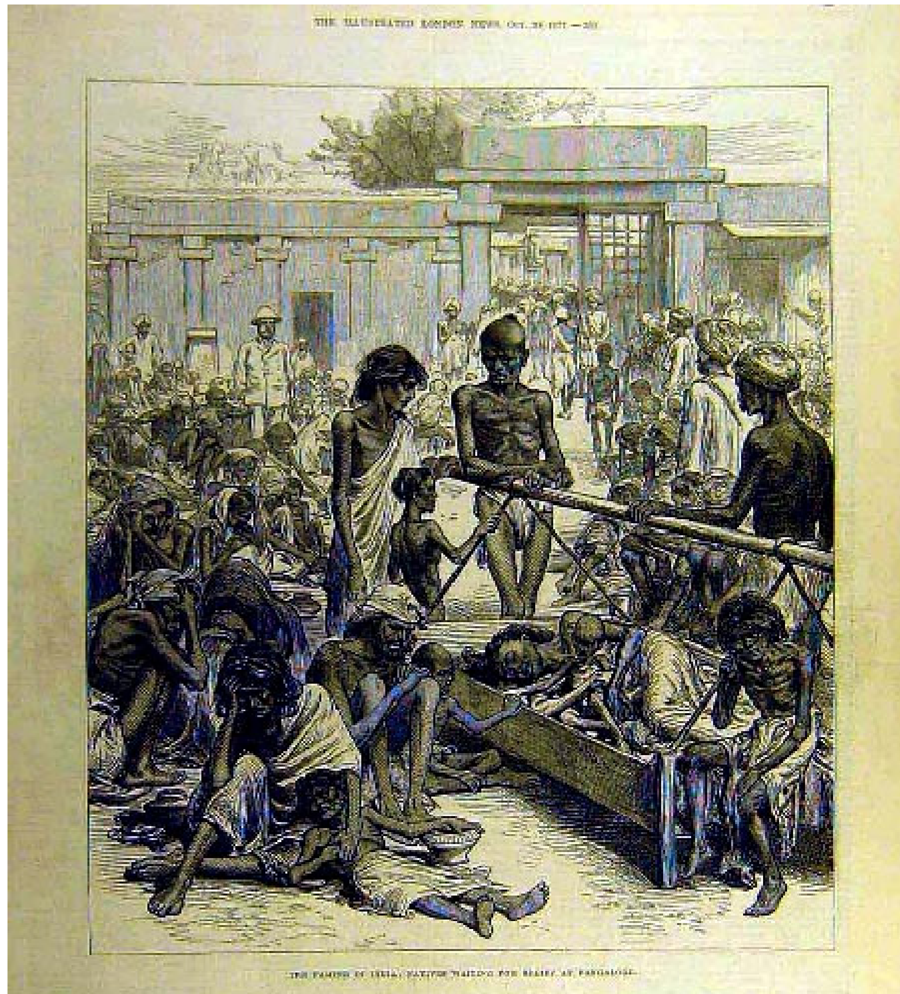


Figure 7 Famine in Madras province, 1877



Madras Famine 1877-1878
Willoughby Hooper - Album print private collection
(source: Indian Art - By Vidya Dehejia p. 399-402).

***

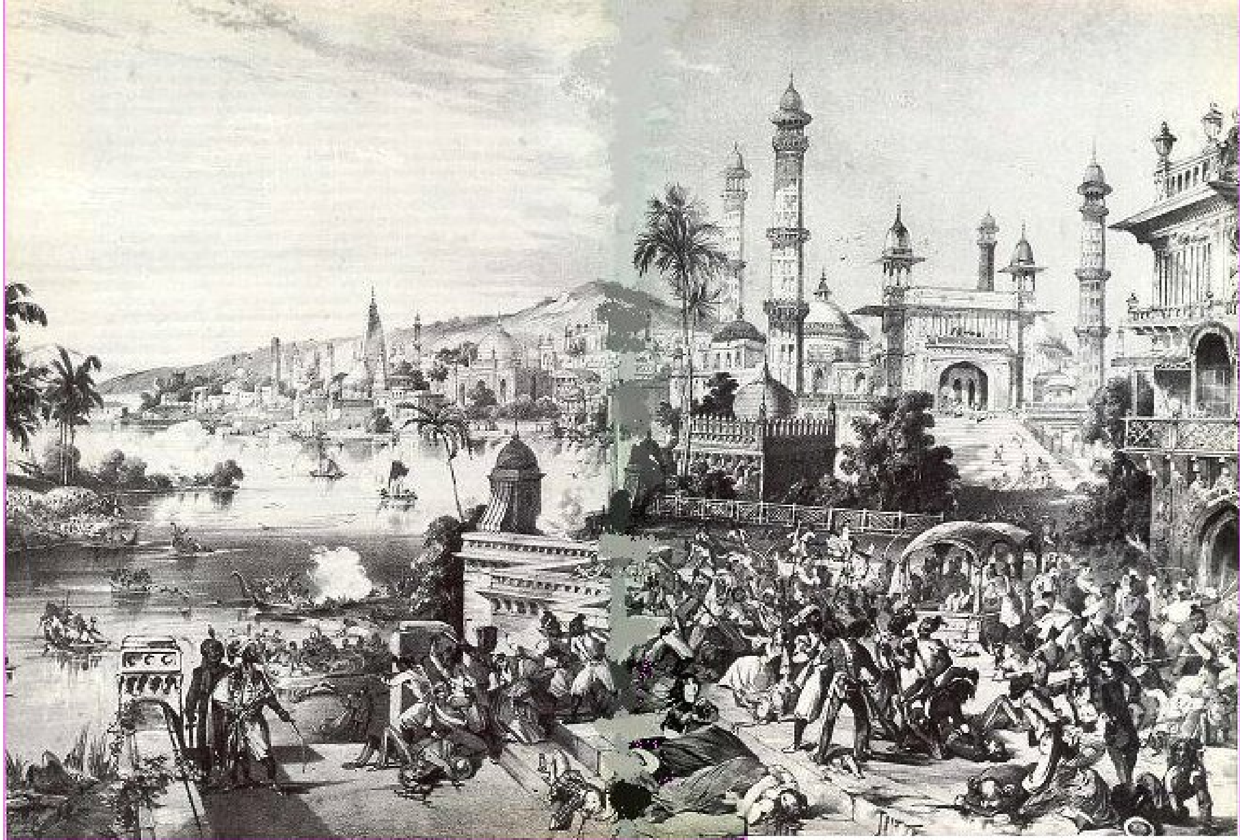


Figure 8 The Great Uprising of 1857

This was an uncoordinated spontaneous uprising against the tyranny of the British rule in India. There is no question that the British would have been overwhelmed had there been a coordinated attack by the Indians.The total number of British were less than 30,000 at that period. But that was not to be. Significant sectors of the population remained apathetic to the uprising. The result was that there was a terrible reprisal of Indian lives by the British , when they went on a rampage killing thousands of Indians. The underlying premise behind the British actions and their reprisal was 'how dare they rebel against our rule'.

"The discovery unleashed an "all but national cry for unmitigated vengeance" (Ball 2:168); the "retributive impulses of our people," as the historian Sir John Kaye calls them (2:170), were given even freer rein than before. One primary instrument of these impulses was the sternly pious Colonel (subsequently rewarded for his vengefulness by being promoted to Brigadier General) James Neill, who already had made a name for himself for the ferocious retribution he had inflicted elsewhere upon mutineers and their suspected sympathizers. Left in command at Cawnpore as Havelock moved on to attempt the relief of Lucknow, Neill invented a form of extra punishment for condemned men thought to have been implicated in the massacre. Before being taken out to the gallows, each was forced to clean up with his own hands or to lick up a small square of dried blood from the courtyard pavement where the prisoners had been slaughtered—an appalling pollution for a high-caste Hindu, as most of the sepoys were. Neill proudly expressed his conviction that God was at work in the "strange law" that he had instituted (Ball 2:400). This was only one of the best publicized of many instances of merciless reprisals visited by British authorities, often on the flimsiest legal pretexts, upon Indian combatants and civilians in the course of

the fierce campaign to restore British supremacy in India.”

An estimated 28,000 Indians were hanged or otherwise massacred by the British.

http://www.amazon.ca/Our-Bones-Are-Scattered-Massacres/dp/product-description/0805024379

“A skillful retelling of a celebrated Victorian military engagement: the rebel siege of the north Indian city of Cawnpore during the Indian Mutiny of 1857. When Indian soldiers rose up and slaughtered their own officers, the British public was stunned at their treachery. Astonishment turned to horror as rebels killed European civilians and Indian Christians who had taken refuge in North Indian cities. The slaughter of European women and children led to a far more brutal and indiscriminate British retaliation. Readers in Victorian England had an insatiable appetite for harrowing tales of the mutiny, and European survivors of these events published dozens of histories and memoirs. Journalist Ward follows them closely in his story of the shocking events at Cawnpore, where European soldiers were massacred after being guaranteed safe passage by the local ruler, Nana Sahib, and his treacherous adviser, Azimullah. After harsh imprisonment, the surviving women and children were hacked to pieces and their bodies stuffed into a well. **Enraged at the discovery of what had been done, and inflamed by false accusations of rape, British soldiers forced defeated Indian rebels to lick up the blood of European victims, then executed thousands of them. Some were strapped to cannons and blown to bits.** For decades after the mutiny, any publication presenting the Indian point of view was banned by the British ruler of India. Ward (whose 1985 novel, Blood Seed, dealt with the aftermath of the mutiny) recognizes the British bias of his sources and tries to read between the lines in search of an Indian point of view. But it is perhaps inevitable that the passion of his book comes from its European sources. Ward's gripping account of heroism and cruelty falls short in its attempt to be fair to Indian as well as British victims. (40 illustrations, not seen). -- *Copyright ©1996, Kirkus Associates, LP. All rights reserved.* “



Figure 9 Interior of Fort Taku immediately after capture in 1860



Figure 10 Secundra Bagh after the Great Indian Uprising 1857

http://www.mssu.edu/projectsouthasia/tsa/VIN1/Streets.htm



Figure 11 The Indians were strapped to canon and blown to bits as retribution for 1857

“British public opinion seemed to concur. Many people agreed that the East India Company had made its bed and was now lying in it. Company officers were blamed for excessive conversion efforts among their Hindu and Muslim sepoys as "one cause of the outbreak."[61] *Blackwood's Magazine*, a respected journal with clear connections to an imperially-minded audience, suggested in addition that "our leaders were unequal to their duty" in the crisis.[62] So great was the general contempt for the perceived blunders of the East India Company that the Anglo-Indian *Delhi Gazette Extra* was forced to concede, "[t]he British public remain utterly impassive and indifferent, and become impatient when the subject is broached in conversation. They have made up their mind that it was entirely owing to the insolence and incompetency of the Regimental Officers, and seem rather glad that they have suffered for their supposed dereliction of duty."[63]

But when news of the Kanpur massacre began to filter into Britain by the late summer of 1857, the mood of the British public shifted abruptly away from its previous critical mode. In the wake of the murders, the Rebellion metamorphosed from a military conflict on the imperial periphery to a popular national struggle in which even ordinary Britons felt invested. The specter of British women and children being murdered by colonial men proved to be a catalyst by which ideologies of gender and race became both inseparable and central to the British ‘cause’ in India.[64]

Coverage of the event was widespread and sensational in national, provincial, and local papers all over Britain. *The London Times* alone carried one hundred eight stories on the massacre between August 15, 1857 and February 3, 1860. All of the largest national newspapers, regardless of political affiliation, featured intensive coverage of the murders—including *Reynolds’s*, *Lloyd’s*, and *News of the World*. In addition to selling newspapers, these ‘horrors’ also inspired unprecedented local action, by prompting packed meetings to pledge money for the victims of the Rebellion.[65]

The depth of public reaction to the murders was due in large part to the lurid nature of the published accounts. Though papers frequently argued that the ‘vile tortures’ practised upon British women and children should "be remembered, not told," all of them did in fact ‘tell’ of rape and torture in graphic detail.[66] Letters and telegraphs flooded the papers with accounts of women being raped in front of their children before being killed, of matted blood, gory remains of children’s limbs, and of the suffocation of living children among their dead mothers when the victims were thrown into a well.[67]

Such graphic tales of rape and murder inflamed public sentiments calling for vengeance on a massive scale.[68] The *Illustrated London News* voiced its indignation in tandem with most other national, provincial, and local papers when it claimed that "every British heart, from the highest to the humblest of the land, glows with honest wrath, and demands <u>justice</u>, prompt and unsparing, on the bloodyminded instruments of the Rebellion."[69] Leading national and provincial papers went so far as to advocate the ‘extermination’ of Muslim and Hindu rebels.[70] In India, the *Delhi Gazette* also proclaimed that "the paramount duty of the British Government is now retribution—a duty to the dead and living."[71]

This vengeance was imagined against perpetrators who had come to represent a potent mixture of masculine, racial, and religious depravity. Sepoys were represented in the press not as men, but as "demons" and "fiends," led by their "passions" to "faithlessness, rebellion, and crimes at which the heart sickens."[72] Their apparent thirst for innocent blood—and their reported lust for forbidden women—had unmanned them, and placed them outside the boundaries of masculine honor. Moreover, their decision to operate outside these rules of conduct absolved the British from addressing their grievances or from showing them mercy. A poem in the Anglo-Indian *Delhi Gazette* put it plainly when it cried, "No mercy's shown to men whose hands/ With women's blood yet reek!"[73]

That rebel sepoys would commit such unspeakable crimes against women was attributed both to racial characteristics and to religion. In India, the conflict had hardened racial hatreds among British officers long before Kanpur. Correspondence reveals widespread use of the word ‘nigger’ and other racially antagonistic language when referring to natives, and officers writing home frequently echoed the contention that "[t]he race of men in

India are certainly the most abominable, degraded lot of brutes that you can imagine, they don't seem to have a single good quality."[74] In the British and Anglo-Indian media, such language received almost unqualified sanction in the wake of Kanpur. Despite the fact that a majority of high-caste Bengal army sepoys were traditionally recruited for their tall physiques and light skin, British sources depicted "gangs of black satyrs" raping and dismembering British women, and called rebel Indians "that venom race," "in heart as black as face."[75]

These 'black' villains were also believed to be depraved because of their religion, whether Hindu or Muslim, for in both cases religion was presumed to have encouraged the rape and murder of British women. Rumors circulated that some of the women at Kanpur were raped, kidnapped, and forced to convert to Islam.[76] High-caste Brahmins were said to be slaves to the requirements of caste, which supposedly included debased notions of masculine honor. Shortly after Kanpur, the *Delhi Gazette* bellowed:

We shall never again occupy a high ground in India until we have put a yoke upon the Brahmins. We have conceded too much to the insolence of caste. Not one high caste man should henceforward be entrusted with a sword.... He has been trusted with power, and how has he betrayed it? The graves of 100 English women and children—worse, the unburied bones of those poor victims—are the monuments of high bred sepoy chivalry.[77]

By their crimes at Kanpur, then, both Hindu and Muslim sepoys had given up all claims to manliness, to honor, to bravery, and to chivalry. Moreover, both their 'race' and their religion were increasingly called upon to explain the loss of those claims.

The effects of such narrative constructions were not merely textual—instead, they had real effects in the material world. Perhaps most importantly, they legitimated acts of appalling vengeance by British forces. At the same time, however, British control over these narratives either glossed or completely ignored the extent of British acts of brutality against Indian soldiers and civilians. As one of the conflict's most influential historians put it in 1864, the Rebellion had been fought by "English heroes" who, in the end, "marched triumphantly to victory."[78]

More recently, a growing number of historians have acknowledged that these "English heroes" were responsible for savage acts of retribution in India. Once it was clear that the Rebellion might induce any number of Bengal army regiments to mutiny, for example, many British officers lost no time making examples of the mutineers through execution.[79] Punishment was sometimes general, involving the slaughter of whole, or nearly whole, regiments. This was the fate of the 51st and 26th regiments, who both fell victim to the "unceasing vigilance" of John Lawrence in his proactive efforts to stem the Rebellion in the Punjab.[80] Of the 26th, Lawrence noted in August 1857 that, "we have killed and drowned 500 out of the 600 men of the… regiment."[81]

In addition to military executions, the British also exacted severe reprisals on civilian populations in north-central India. The notorious actions of Colonel James Neill, called to Bengal from the Madras army to help suppress the Rebellion, bear directly on the events surrounding the Kanpur massacre. After arriving in Allahabad on June 11, 1857, Neill was responsible for thousands of murders both of sepoys and suspected rebels as well as innocent men, women, and children. Describing the actions of Neill's troops around Allahabad, one officer wrote:

Every native that appeared in sight was shot down without question, and in the morning Colonel Neill sent out parties of regiment [?]...and burned all the villages near where the ruins of our bungalows stood, and hung every native that they could catch, on the trees that lined the road. Another party of soldiers penetrated into the native city and set fire to it, whilst volley after volley of grape and canister was poured into the fugitives as they fled from their burning houses.[82]

On June 29 1857, Neill ordered "the village of Mullagu and neighborhood to be attacked and destroyed—slaughter all the men—take no prisoners." He added, "all insurgents that fall into good hands hang at once—and shoot all you can."[83]

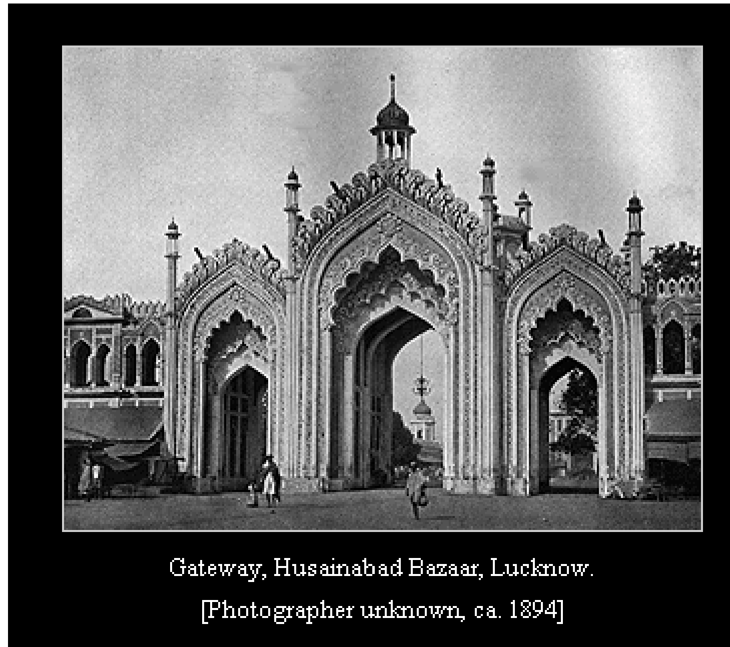
Significantly, Neill's 'bloody assizes' around Allahabad (as they came to be known) occurred before, not after, the massacre of British women and children at Kanpur on July 15. Some scholars have speculated that the murders were ordered in retaliation for the Indian civilians whose murders Neill personally supervised.[84] Whether or not such a contention can be proven, it is nevertheless clear that Neill's brutality could not have been justified by the Kanpur massacre as was so often contended, for his own excesses preceded the event.[85]

Yet while British atrocities preceded the massacre at Kanpur, once news of the killings spread they were used to justify retaliatory murders and punishments on an astonishing scale. Neill himself, who was with the first British force to enter the city two days after the massacre, invented macabre executions for both Hindu and Muslim sepoys that were designed to ensure both intense suffering before death and eternal damnation afterwards.[86]

British soldiers sent to India offered ample testimony to the scale of British retaliation against both military and civilian targets. Sergeant David McAusland of the 42nd Highland Regiment recalled that during his service in Bareilly during the Rebellion, "three scaffolds and six whipping posts stood outside of the town along side of the jail and there [took place] executions to the number of six every day." The judge in charge of trials had lost his wife during the conflict, and had told McAusland, "if ever I get the chance of [judging] these Black rebels I will hang a man for every hair that was in my wife's head." McAusland responded by asking him how many men he had executed already, "he told me close on 700 well I said if you just continue you will have made good your work and turning to Sergt…Aden I said you mind what Sir Colin [Campbell] said to us at Cawnpore that every man that had a black face was our enemy and we could not do wrong in shooting him so you know how to act here."[87]

Private Alexander Robb, also of the 42nd, described the first summary hanging of an Indian civilian he witnessed during the Rebellion, adding, "that was the first man I saw dancing on nothing in India, but it was not the last, for I saw some awful sights in that line."[88] Lieutenant Robert Bruce McEwen of the 92nd Gordon Highlanders recorded, on numerous days, routinely shooting large numbers of prisoners and in taking part in actions where between 500 and 700 rebels were killed.[89] And when British forces finally attacked and re-took the city of Delhi in September, 1857, they were merciless in their treatment of soldiers and civilians alike.[90]

As these stories indicate, the history of the Rebellion—like all historical subjects—is continually in the process of being revised and re-interpreted. Scholars in the post-colonial period in particular have challenged British-centered accounts of the Rebellion, emphasizing instead the widespread nature of the conflict among Indian civilians as well as soldiers, and the scale of British retribution and violence. In recent years, historians of gender and racial theory have also contributed to the re-interpretation of the Rebellion by emphasizing the important consequences of the conflict for imperial ideologies. All of these approaches have helped to deepen our understanding of this bloody, brutal, but significant conflict. For the Rebellion was both a military mutiny and a peasant rebellion; it included murders and atrocities on both the British and the Indian sides; and it was significant not just in military terms but in ideological and historiographical terms as well.



Gateway, Husainabad Bazaar, Lucknow.
[Photographer unknown, ca. 1894]

Figure 12 Hussainabad Bazaar, Lucknow

Figure 13

Estimated GDP PPP Basis through the ages

Indic Studies Foundation

(A California non-profit Organization)

www.indicethos.org

1 CE

Rank	Country/ Region	GDP (PPP) mill. of International dollars	GDP Share percentage (%)
—	World	102 536	100
1	India	33 750	32.9
2	China	26 820	26.2
3	Middle East	16 470	16.1
4	Western Europe	11 115	10.8
5	Africa	7 013	6.8
6	Latin America	2 240	2.2
7	Eastern Europe	1 900	1.9
8	Russia	1 560	1.5
9	Japan	1 200	1.2
10	North America & Australia	468	0.5

1000

Rank	Country/ Region	GDP (PPP) mill. of International dollars	GDP Share percentage (%)
—	World	116 790	100
1	India	33 750	28.9
2	China	26 550	22.7
3	Middle East	16 470	16.0
4	Africa	13 723	11.8
5	Western Europe	10 165	8.7
6	Latin America	4 560	3.9
7	Japan	3 188	2.7
8	Russia	2 840	2.4
9	Eastern Europe	2 600	2.2
10	North America & Australia	784	0.7
[illegible]			

1600

Rank	Country/ Region	GDP (PPP) mill. of International dollars	GDP Share percentage (%)
—	World	329 417	100
1	China	96 000	29.2
2	India	74 250	22.6
3	Middle East	36 725	11.2
4	Africa	22 000	6.7
5	France	15 559	4.7
6	Italy	14 410	4.4
7	Germany	12 432	3.8
8	Russia	11 447	3.5
9	Japan	9 620	2.9
10	Eastern Europe	8 743	2.7
11	Spain	7 416	2.1
12	United Kingdom	6 007	1.8
	[illegible]		

1700

Rank	Country/ Region	GDP (PPP) mill. of International dollars	GDP Share percentage (%)
—	World	371 369	100
1	India	90 750	24.4
2	China	82 800	22.3
3	Middle East	40 567	10.9
4	Africa	24 400	6.6
5	France	21 180	5.7
6	Russia	16 222	4.4
7	Italy	14 630	3.9
8	Germany	13 410	3.6
9	Japan	15 390	4.1
10	United Kingdom	10 709	2.9
11	Eastern Europe	10 647	2.9
12	Spain	7 893	2.2

2006

Rank	Country	GDP PPP	GDP share%
	World	66,582,750	
1	USA	13,201,819	19.8
2	China	10,043,780	15.1
3	India	4,247,361	6.38
4	Japan	4,202,524	6.31
5	Germany	2,570,810	3.86
6	UK	2,118,130	3.18
7	France	1,941,904	2.91
8	Italy	1,753,663	2.63
9	Brazil	1,707,712	2.56
10	Russ Fed	1,704,036	2.56

Estimated GDP of Leading Countries (PPP Basis)through the ages

Source WikiPedia, compiled from *The World Economy: A Millennial Perspective* by economic historian Angus Maddison.

Appendix O

Index



(964 words)